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ON THE "POLAR STAR"
IN THE ARCTIC SEA



Alton S. G. S.

Preparing to Camp.

Luigi, duke of the Abruzzi

On the "Polar Star"

IN THE ARCTIC SEA

BY HIS ROYAL HIGHNESS

LUIGI AMEDEO OF SAVOY

DUKE OF THE ABRUZZI



WITH THE STATEMENTS OF COMMANDER U. CAGNI UPON THE
SLEDGE EXPEDITION TO 86° 34' NORTH, AND OF DR. A. CAVALLI
MOLINELLI UPON HIS RETURN TO THE BAY OF TEPLITZ

TRANSLATED BY

WILLIAM LE QUEUX

IN TWO VOLUMES, WITH 212 ILLUSTRATIONS
IN THE TEXT, 16 FULL-PAGE PHOTOGRAVURE
PLATES, 2 PANORAMAS, AND 5 MAPS

VOL. II

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REPORT OF
COMMANDER UMBERTO CAGNI
ON THE
SLEDGE EXPEDITION
TOWARDS THE POLE

CHAPTER I

Preparations for the Expedition. Departure for
the North. Return to the Hut

CHAPTER I

PREPARATIONS FOR THE EXPEDITION. DEPARTURE FOR THE NORTH. RETURN TO THE HUT

THE most difficult, and, at the same time, the most important problem to be solved with regard to the expedition towards the north was that of food ; and we all busied ourselves—and Dr. Cavalli more than the others—with the most scrupulous care in getting our provisions ready.

The rations which had been originally settled, afterwards underwent some slight changes with the object of rendering them more easy to distribute, and the following estimate was at last decided on :—

	oz.	dr.
Biscuit	14	1
Tinned meat	8	12
Pemmican	10	9
Butter	3	4
Milk	1	2
Liebig's Extract	0	5
Desiccated vegetables	0	14
Italian paste	1	12
Sugar	1	6
Salt	0	7
Tea and Coffee	0	13
Petroleum for cooking	3	8
	lb. 2	14 13

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The expedition required :—

For the first detachment, three rations for 30 days, or 90 rations

For the second detachment, three rations for 60 days, or 180 „

For the third detachment, three rations for 90 days, or 270 „

Total number of rations 540

To carry out the idea according to which the expedition had been organised by detachments, these 540 rations were divided in the following manner :—

For the three detachments for the first 15 days . 135 rations

For the return of the first detachment 45 „

180 rations

to be given to the first detachment.

For the second and third detachments for the second

fortnight 90 rations

For the return of the second detachment 90 „

180 rations

to be given to the second detachment.

For the third detachment for the third fortnight . 45 rations

For the return of the third detachment 135 „

180 rations

to be given to the third detachment.

By dividing them in this manner each detachment would have to carry very nearly the same weight of food, and would have come to the end of it by the time that its special duty should have been performed.

The meat, the butter, the Liebig's Extract, and the milk in their respective cases were put all together into bags which held exactly forty-five rations; the biscuits, the Italian paste, and the vegetables

into tin cases which held thirty or forty rations, and were hermetically soldered; the tea, the coffee, the sugar, and the salt into old cigar boxes, which held thirty rations, and were closed with wax. A part of the pemmican for the men was left in its original tin cases of the net weight of 44 lb. 1 oz.; and the rest, amounting to forty-five rations, into bags holding 29 lb. 11 oz. 14 dr.

The petroleum was contained in strong iron tanks, made in Norway,



CAGNI'S DEPARTURE

to which a cock could be fitted, and holding 23 lb. 2 oz. 4 dr., or 105 rations. As the food intended for the first detachment would be exposed to the air for only a short time, it was put into small bags, each containing three whole rations; the meat had been taken from the tins, left outside the tent to freeze, then wrapped up in paper and put with the biscuits.

To these provisions were added 3 lb. 4 oz. 14 dr. of compressed

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THE PROVISIONS OF THE FIRST DETACHMENT

(*For the Journey back*)

	No. of Rations.	Weight.	Total.
		lb. oz. dr.	lb. oz. dr.
Half case of pemmican for the men	45	29 12 3	
A case with tinned meat, biscuit, vegetables, and groceries	36	70 8 12	
Bags with meat, biscuit, Italian paste, vegetables, and groceries	9	19 13 7	
A bag with butter, milk, and Liebig's Extract . .	45	17 10 3	
Two cases of petroleum	50	12 2 0	
A bottle of methylated spirits to light the lamp .	—	1 15 11	
Onions, matches, and a pound of tobacco . . .		2 6 12	
		154 5 0	154 5 0

FOR THE FIRST, SECOND, AND THIRD DETACHMENTS

(*First Fortnight*)

	No. of Rations.	Weight.	
		lb. oz. dr.	
Forty-five bags containing biscuits, Italian paste, meat, and vegetables	135	198 6 10	
Two bags containing butter, Liebig's Extract, and milk	135	50 10 0	
Four boxes and a half of groceries	135	28 10 8	
Two boxes of pemmican for the men	135	91 7 13	
A case of petroleum and three lamps filled . . .	141	36 6 0	
		405 8 15	405 8 15
Total			559 13 15

THE PROVISIONS OF THE SECOND DETACHMENT

(For the Journey back)

	No. of Rations.	Weight.	Total.
		lb. oz. dr.	lb. oz. dr.
A case containing biscuits, Italian paste, and vegetables.	60	70 1 11	
A half case with biscuits, Italian paste, and vegetables.	30	39 3 13	
Two bags with meat, butter, milk, and Liebig's Extract	90	90 0 6	
Three boxes of groceries.	90	19 2 14	
A case of petroleum.	105	28 3 8	
A case and a half of pemmican for the men . . .	90	61 11 10	
A bottle of spirits	—	1 15 11	
Onions, matches, and two pounds of tobacco . .	—	4 13 9	
		315 5 4	315 5 4

FOR THE SECOND AND THIRD DETACHMENTS

(Second Fortnight)

	No. of Rations.	Weight.	
		lb. oz. dr.	
As above, with the exception of the spirits, the onions, the matches, and the tobacco . . .	90	308 10 5	308 10 5
Total		623 15 9	

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THE PROVISIONS OF THE THIRD DETACHMENT

	No. of Rations.	Weight.	Total.
		lb. oz. dr.	lb. oz. dr.
Three cases containing Italian paste, biscuits, and vegetables	180	212 5 10	
Four bags with meat, butter, milk, and Liebig's Extract	180	179 10 12	
Six boxes of groceries	180	38 5 12	
Two cases of pemmican for the men	135	91 7 13	
One bag of pemmican for the men	40	27 8 14	
Two cases of petroleum	210	56 3 7	
A bottle of alcohol		1 15 11	
Onions, matches, and three pounds of tobacco		6 9 13	
		614 3 12	614 3 12

Total weight of the men's provisions 1,798 1 4

onions, divided among the three groups in proportion to the time during which they were to be away.

When the various packages had been thus distributed, their coverings, whether of canvas or of tin, were painted with stripes, which were :—black for the first detachment, green for the second, and red for the third ; they were also stamped in large figures, with the number of rations they contained and their gross weight.

CLOTHING AND CAMP EQUIPMENT

It would have seemed at first sight more logical to have allotted a greater quantity of clothing to those who were to pass a longer time on the ice-pack ; but to do so, it would have been necessary to assign to each individual his place in one of the detachments from the outset.

This would have been both dangerous and impracticable, since none of us had as yet been tried by such a severe and continuous strain as the march towards the north would probably demand. Moreover, even if it were possible to make a choice before this trial took place, it might happen that, during the march, some illness or accident might cause individuals belonging to different detachments to be substituted for one another. For these reasons, therefore, it was decided that no difference should be made between the members of the expedition with regard to their clothing or their other personal effects.

The clothing and the camp equipment were selected with the same scrupulousness and precision as had guided us in the preparation of the provisions.

When the principal articles of clothing were given out, each one had them adapted to his own measure; but, with the exception of some insignificant variations, it was forbidden to make any change in them which should not be considered useful, and should, therefore, be prescribed for all.

On setting out, the men were obliged to put on and to wear :—

Woollen stockings.	Gauntlets with separate thumb or woollen gloves.
Woollen drawers.	Thick woollen gauntlets.
A woollen vest.	A smock frock of thin linen with a hood.
A second woollen vest or a flannel shirt.	A handkerchief.
An Icelandic or sailor's jersey.	A belt carrying a knife with a fixed blade, a compass, a slow match, and a whistle.
A complete Jaeger suit.	A box of matches, a bandage, and a tube of vaseline.
Double boots of reindeer-hide.	Two Dum-Dum cartridges.
A knitted woollen helmet.	A knife with several blades.
A flannel cap with flaps to cover the ears.	
Woollen wristlets, or bands of wool round the wrists.	

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CAMP FURNITURE AND ACCESSORIES FOR EACH DETACHMENT

	No.	Weight.		
		lb.	oz.	dr.
Complete tent with its bamboo poles	1	33	1	1
Sleeping-bag of reindeer-skin ¹	1	48	8	0
Cooking-stove	1	7	4	12
Two pots		2	14	3
A <i>Primus</i> lamp	1	1	15	6
A spare burner and two ejectors				
A jointed key for the ejector				
A key for the burner				
Washers of leather and indiarubber	1	0	8	13
Eight needles for cleaning				
Two spare rings				
A tin funnel				
Three glasses and three mess-tins				
A ladle and three spoons	—	3	0	10
Double-barrelled gun '303 calibre, 20 bore, with a waterproof canvas case ²	2	19	13	7
Sixty cartridges		1	12	5
A medicine-chest ³		6	13	5
A bottle of rum or cognac	2	3	15	7
Carried forward		129	11	5

¹ There was some difference in the weights of the different sleeping-bags ; 48 lb. 8 oz. represent the average weight.

² Instead of two guns, the third detachment had a double-barrelled gun of '305 calibre and 20 bore, and a '303 calibre rifle which weighed 7 lb. 4 oz. 6 dr.

³ The medicine-chest contained :—

Two packages of cotton wool.
A package of gauze.
Eight gauze bandages.
Three starched bandages.
Two flannel bandages.
A piece of linen.
Three Esmarck bandages.
Cotton with perchloride of iron.
Two trusses.
Two pairs of spectacles.
Pins, needles, and silk.

A piece of soap.
Two splints for fractures.
A medicine-dropper.
Diachylon plaster.
A wax taper.
Sticking plaster.
A waterproof.
Vegetable pills.
Calomel pills.
Salol pills.
Tannin pills.

	No.	Weight.		
		lb.	oz.	dr.
Brought forward		129	11	5
A large Zeiss prismatic binocular and a small one, weighing together	1	2	3	4
An aluminium sextant	1	6	4	8
An artificial glass horizon				
Thermometers	2			
An aneroid ¹	1	1	1	10
A prismatic compass	1			
A case of instruments ²	1	8	13	1
Magnaghi's tables, notebooks, and pencils		2	15	9
Ice-axes	4	13	3	10
Alpine rope ¹	2	7	0	14
Fifty yards of thin twine	1	3	15	7
A ball of strong cord	1	1	12	3
Two yards of strong sailcloth for mending the <i>kayaks</i>	—	6	6	4
A yard of strong calico for mending the tent and the <i>kayaks</i>	—	0	10	9
Steel wire for tethering the dogs	4	1	12	3
An axe	1	0	12	5
An ice-hook to be fixed to one of the tent poles	1	0	4	9
Thread, worsted, needles, twine, and sewing gauntlet	—	0	7	0
National flag, in its case		2	3	4
Total		189	9	9

Opium pills.

Strychnine pills.

Caffeine pills.

Digitalis pills.

Cocaine pills.

Quinine pills.

Morphine pills.

Chloroform.

Ophthalmic discs.

Boroglycerine.

Discs of sublimate.

Catheters.

Lancets, scissors, a probe, and forceps.

Indiarubber cups.

Directions for the use of drugs.

In the medicine-chest of the third detachment there was, besides, a small bottle of lemon juice.

¹ The third detachment carried also a maximum and a minimum pocket thermometer, a Kodak 9 × 13, and four rolls of film. As compensation for this additional weight one of the Alpine ropes of the third detachment was of silk, and weighed 10 oz. 9 dr., and the .303 calibre rifle was lighter than a fowling-piece.

² This box was of wood, and besides the instruments, it held the lamp and its accessories, notebooks, and all the small objects we wanted to have at hand.

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They had also leave to carry in addition : -

Braces.
Knee-caps.
A pair of light stockings.
A pipe and eight ounces of tobacco.

Each man was provided with a bag of waterproof canvas containing supplementary clothing, which consisted of :

A woollen vest.	A complete wind-proof suit.
A pair of woollen drawers.	A pair of <i>kömagers</i> filled with grass.
Two pairs of woollen stockings.	Two pairs of <i>finskos</i> filled with grass.
Two pairs of goats'-hair stockings.	A pair of long stockings of sailcloth.
Two pairs of woollen gloves.	A woollen cap.
Two pairs of woollen gauntlets.	A pair of woollen bands for the legs.
A pair of fur gauntlets with leather cuffs.	A package of paper.
A pair of light gauntlets with a separate finger.	Two pairs of snow spectacles.
	A towel.

Each bag weighed on an average twenty-four pounds, including the covering. Besides this supplementary clothing, each man received :

A Jaeger jacket,
A knitted woollen helmet,
A pair of Jaeger stockings for night,
A pair of light fur gloves,

of which the total weight was - lb. 4 oz., and these articles were put in the reindeer-skin bag common to all, so as to be at hand when about to pitch our camp.

The men were forbidden to carry even the smallest object beyond what has been mentioned above, and they scrupulously obeyed the order.

The total weight of the clothing for nine men, which was to be carried on the sledges, amounted, therefore, to 282 lb.

Preparations for the Expedition 359

The total weight of the camp equipment and the accessories for the three detachments was, therefore, 568 lb. 12 oz. Three lanterns were also carried and thirty-six candles, weighing altogether 151 lb. 6 oz., which were to be used during the first days of the march.

To this should be added the weight of the four *kayaks*, which, with their accessories—such as a sail, a pump, two rowlocks, three oars, a box with materials for repairs—weighed each fifty-five pounds, and altogether 220 lb. ; and the weight of the train of twelve sledges, each of which weighed forty-four pounds,—528 lb. altogether.

FOOD FOR THE DOGS

As it had been decided that each sledge should carry a load of 617 lb. 4 oz. 11 dr., including its own weight, twelve sledges ought to draw 7,407 lb. 8 oz. 4 dr. Deducting from this load :

The men's provisions	1,798 lb.
The clothing	282 ..
The camp equipment and accessories	568 ..
The <i>kayaks</i>	220 ..
The sledges	528 ..
	-
	3,396 lb.

there remained for the dogs' food 4,011 lb. (which, taking into account the weight of the cases, was equal to 3,725 lb.) of pemmican, or 3,380 rations. This amount was, therefore, to support our dogs during all the time of the expedition in such a way that the average weight to be drawn by each should not be more, when setting out, than seventy-seven pounds, and should be gradually reduced in proportion as their strength should be reduced by the prolongation of their efforts.

The table on p. 361 shows the calculations according to which the feeding and loads of the dogs, day by day, had been

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previously estimated. It was based upon the supposition that each dog, when killed, would provide ten rations for the survivors, thus :—the average weight of our smaller dogs was about forty-four pounds, from which one-tenth might well be deducted, since only those that were more worn out than the rest would be selected for killing; of the thirty-nine pounds remaining, it was reckoned that only about one-third could serve as food, which would thus furnish ten rations of 1 lb. 5 oz. 2 dr., the nutritive value of which would nearly correspond to the usual ration of 1 lb. 1 oz. 10 dr. of pemmican. In these calculations we took care to keep within the exact figures in order to avoid any unpleasant surprise afterwards.

On the morning of the sixteenth day the detachment which was to return would be provided with :—

	lb.	oz.	dr.
Thirteen dogs.			
A sledge	44	1	7
Forty-five rations for men (weighing with the cases) .	154	5	2
Clothing for three men	92	9	7
Camp equipment for the detachment	189	9	8
Eighty-two rations of pemmican for the dogs (weighing with the cases)	94	4	12
	574	14	4
Besides this, a sledge would have been left behind weighing	44	1	7
The cases of the 1,132 rations of pemmican eaten by the dogs, weighing about	61	11	6
	680	11	1
This should be deducted from the load remaining on the evening of the fifteenth day, amounting to	5,620	10	6
	<u>4,939</u>	<u>15</u>	<u>5</u>

The rest of the train would continue on its way with eight sledges, sixty-eight dogs, and 2,162 rations for them—a total load of 4,940 lb. The dogs, which, when setting out, would each have to draw, on an

Preparations for the Expedition

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Days from setting out.	Number of sledges.	Dogs.	Average weight for each Dog.		Weight of food consumed.		Remaining.		Dogs killed. ¹	Sledges left behind.
			lb.	oz. dr.	lb.	oz. dr.	Dogs' rations.	Total weight of load.		
					lb.	oz. dr.	Men.			
0	12	100	—	—	—	—	—	3,380	7,407 8 4	—
1	12	102	74 0 9	617 4 10	85 15 10	29 12 3	3,302	7,291 11 14	2	—
2	12	98	74 4 11	607 9 7	83 12 6	29 12 3	3,226	7,177 13 1	2	—
3	12	96	75 2 13	591 13 12	81 9 2	29 12 3	3,152	7,066 14 0	2	—
4	12	94	75 2 13	—	79 5 13	29 12 3	3,080	6,957 5 11	2	—
5	12	92	75 9 14	—	89 4 9	29 12 3	2,999	6,838 11 2	1	—
6	12	91	74 15 4	569 14 5	88 5 7	29 12 3	2,919	6,680 9 0	1	1
7	11	90	74 1 3	606 14 13	86 12 5	29 12 3	2,840	6,559 13 0	1	—
8	11	89	73 7 10	561 3 0	85 15 10	29 12 3	2,762	6,444 1 2	1	—
9	11	88	73 3 1	—	84 14 0	29 12 3	2,685	6,329 6 0	1	—
10	11	87	72 12 0	—	83 12 6	29 12 3	2,609	6,215 12 5	1	—
11	11	86	72 1 7	—	82 10 12	29 12 3	2,534	6,103 7 5	1	—
12	11	85	71 10 6	554 14 6	81 9 2	29 12 3	2,460	5,948 0 9	1	1
13	10	84	70 12 4	594 12 13	80 8 1	29 12 3	2,387	5,837 8 14	1	—
14	10	83	70 5 3	—	79 5 13	29 12 3	2,315	5,728 10 13	1	—
15	10	82	69 14 2	572 12 1	78 4 3	29 12 3	2,244	5,620 10 6	—	—

¹ The dogs were to be killed in the evening, after the day's march.

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average, a weight of seventy-two pounds, would have had it lightened by about four pounds, in the course of a fortnight. By killing a dog every day and abandoning two more sledges, there would remain on the evening of the thirtieth day, after the distribution of provisions, a load of 3,706 lb. 7 oz. 3 dr., carried upon six sledges, fifty-three dogs, and 1,397 rations for them.

The second detachment would be provided for its return with :—

	lb.	oz	dr.
Seventeen dogs.			
Two sledges with two <i>kayaks</i>	198	6	10
Ninety rations for the men (weighing with the cases)	315	4	2
Clothing for the men	92	9	7
Camp equipment for the detachment	189	9	8
300 rations of pemmican for the dogs (weighing with the cases)	346	1	15
	1,141	15	10
The cases thrown away during the fortnight would amount to	55	1	13
	1,197	1	7
This should be deducted from the load remaining on the evening of the thirtieth day, amounting to	3,311	5	11
	2,114	4	4

The third detachment would then go on with four sledges, thirty-six dogs, 1,097 rations for them, and a load weighing altogether 2,114 lb. The weight drawn by each dog would average seventy pounds; on the forty-fifth day this would be reduced to sixty-six pounds, and on the sixtieth day to fifty-six pounds. The dogs' pemmican would be exhausted on the eighty-sixth day, but the fourteen dogs still remaining would only have to draw a load of 599 lb., including the weight of the two sledges.

When matters were thus settled, nothing remained but to arrange the loads to be carried by the sledges.

In principle it was desirable that these should be made up in such a way that, when pitching a camp and serving out rations every day, as few loads as possible should be unpacked, and that, besides, each detachment should have everything belonging to it on the four sledges allotted to it.

But the practical execution of this principle had naturally to be subordinated by the special arrangement of packages, of various



"WE BEGAN TO PACK ON FEBRUARY 3RD"

weights and sizes, the shape of the sledges demanded, which would render it more easy to draw them, for the way in which the load is packed has a great influence on the stability of a sledge and the resistance to its progress.

After many experiments and considerable measuring the loads were settled, and we began to pack on February 3rd.

The loading was carried out exactly in accordance with the table on pp. 364-5 ; the greater part of the work was completed on

THIRD DETACHMENT

	1	2	3	4
	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.
Sledge	44 1 7	44 1 7	44 1 7	44 1 7
Knife	55 1 13	55 1 13		
Pemmican for the dogs	200 2 4	200 2 4	200 2 4	354 15 1
Pemmican for the men	-	-	27 8 14	91 7 13
Biscuits, Italian paste, and vegetables, in cases	-	-	143 4 12	70 8 12
Meat, butter, milk, and Liebig's Extract, in bags	88 2 2	91 7 13	-	-
Biscuits, macaroni, vegetables, and meat, in bags	57 5 1	88 2 2	-	-
Butter, milk, and Liebig's Extract, in bags	-	-	-	-
Groceries, tea, coffee, sugar, and salt	33 1 1	0 0 13		
Petroleum	-	-		56 3 7
Sleeping-bag with Jaeger jackets, etc.	-	-	70 8 12	-
Tent	-	-	33 1 1	-
Clothing	48 8 0	24 4 0	-	-
Cooking-stove and mess-tins	15 0 14		-	-
Medicine-chest, with a bottle of rum or cognac	-	11 0 5	-	-
Case of instruments	-	-	25 5 10	-
Carbine or gun	-	9 14 11	8 6 0	-
Ice-axes	-	9 14 11	3 4 14	-
Extras	15 0 14	17 10 3		-
Total	617 3 8	618 5 2	615 11 10	617 4 8

N.B.—The outfit and the provisions over which there is a number do not belong to the detachment

* Comprising an addition of 143 lb. 4 oz. 12 dr. of pemmican for the men, to

Preparations for the Expedition

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SECOND DETACHMENT

FIRST DETACHMENT

THE NUMBER OF THE SLEDGE

TOTAL.

5	6	7	8	9	10	11	12	
lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.
44 1 7	44 1 7	44 1 7	44 1 7	44 1 7	44 1 7	44 1 7	44 1 7	529 1 4
55 1 13	55 1 13	—	—	—	—	—	—	220 7 6
260 2 4	286 9 9	260 2 4	200 2 4	313 0 13	351 15 1	449 11 13	544 8 0	3,864 10 0
—	231 7 11	—	—	—	91 7 13	91 7 13	—	533 8 3
—	37 7 10	180 12 7	—	—	—	—	—	432 1 9
90 6 3	45 3 1	—	—	—	45 3 1	—	—	300 7 4
26 7 14 ¹	46 4 11 ¹	—	—	70 8 12	—	—	—	288 12 8
—	—	—	—	17 10 3	24 3 15	—	26 7 4	68 5 6
—	—	38 9 4	—	33 1 1	—	—	—	111 5 3
—	—	—	—	—	56 3 7	39 10 14	—	152 1 12
—	—	—	70 8 12	70 8 12	—	—	—	211 6 4
—	—	—	33 1 1	33 1 1	—	—	—	99 3 3
72 12 0	72 12 0 ¹	—	—	—	—	—	—	218 4 0
15 6 14	15 6 14 ¹	—	—	—	—	—	—	40 4 10
11 0 5	11 0 5 ¹	—	—	—	—	—	—	33 0 15
—	—	—	25 5 10	25 5 10	—	—	—	76 0 14
9 14 11	19 13 7 ¹	9 14 11 ¹	—	—	—	—	—	57 15 8
9 14 11	3 4 14 ¹	—	3 4 14	9 14 11	—	—	—	39 10 11
22 0 11	17 10 3 ¹	—	—	—	—	—	—	72 11 15
617 4 13	617 4 4	621 10 15	617 4 7	616 2 12	616 2 12	624 15 15	615 1 4	7,415 6 13

on whose sledges they are loaded, but to the detachment indicated by the number.

replace an equal quantity of pemmican for the dogs, which had not been taken.

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February 10th, and nearly all the sledges, with their loads secured on them, were drawn up before the hut and protected by large tarpaulin covers.

Knowing, by experience, that during the last days preceding the departure of an expedition it is customary, easy, and, I might say, natural, to augment the stores—sometimes, indeed, considerably—by useless objects which at the time seem indispensable, I was inflexible with regard to the smallest addition to the weight.

Nothing was placed on the sledges which had not been first weighed and examined, and when the packing of nearly three tons and a half had been finished, it was very satisfactory to find that the load was only a few pounds (7 lb. 11 oz. 7 dr.) in excess of our estimate. This difference, which appears on the table, was owing to the greater thickness of some bags, to too many solderings, and to stronger lashings, but not to any increase in the outfit or provisions.

The Longines pocket chronometers had been distributed towards the end of January, and from that time their bearers always carried them on their persons, and compared them every two days with the standard chronometer.

We had had leather cases made in Italy, lined with felt, to carry the chronometers hung from the neck, but only Lieutenant Querini and Dr. Cavalli, who had each a single chronometer, used these cases. As I had three to carry, they would have been an unpleasant weight on my chest, so I replaced them by three pockets of strong flannel sewed beside each other on the thick sailor's jersey which was to replace my shirt during the journey, and I found this method answer very well.¹

¹ For the working of the pocket chronometers, see *Scientific Observations taken during the Polar Expedition of H.R.H. Luigi Amedeo of Savoy, Duke of the Abruzzi*, 1899-1900, Part I., Report of Commander Cagni.

We were now ready to start, and only waited until there were more than five hours of twilight.

As the ice-pack was still away from Teplitz Bay, we had quite given up the idea of getting upon it in that direction, and so thought it advisable to explore the coast from Cape Germania to Cape Fligely, to seek for a spot where it would be easy to descend from the island on to the ice-pack with the train of sledges.

With this object I left the hut, accompanied by Petigax and Fenoillet, and a sledge drawn by eight dogs, on the morning of February 12th, and returned on the evening of the 14th.

During that time the thermometer varied between -24° C. and -31° C., and this was the first occasion that we lived and slept on the ice in such a low temperature, and with no other shelter than a thin tent. Nevertheless, though the weather was not very fine, those two nights were the best of all we passed away from the hut. I attribute this to our excellent state of health, which enabled us to resist cold better than we could later, after we had been struggling against it for several days, for the contest exhausts, instead of accustoming a man to a climate for which he was not created.

The object of our preliminary expedition was accomplished; about three miles from Cape Germania we found a place where it would be very easy to go down to the sea, and near Cape Fligely others where, with a little help from our ice-axes, we could have prepared a gently sloping descent.

On returning from this trip we made some small improvements in the tents for the expedition; the Jaeger hoods were left aside as useless and stifling, and replaced by caps with flaps to protect the ears, which were got ready in great haste after a pattern made by the doctor. The reserve of clothing was increased by a pair of woollen

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gauntlets, and the canvas soles which we had put to our reindeer-skin boots were strengthened with sealskin.

We worked energetically at settling other details until everything was definitely arranged and packed, as indicated by the table.



MOST RELUCTANT TO LET THEMSELVES BE CAUGHT

With the approbation of His Royal Highness, I decided on provisionally forming the detachments as follows:—

Third detachment.—The guides Petigax, Fenoillet, and myself.

Second detachment.—Lieutenant Querini, with the sailors Cardente and Canepa.

First detachment.—The doctor, with the guides Ollier and Savoie.

Thus, as it is understood that after thirty days' march I am to

continue my journey with a guide and a sailor, I shall then have only to choose my companions rather than to set aside one of them, which is always unpleasant for the person dismissed, and also for the person who dismisses. On the other hand, I need to have always at the head of the train a guide accustomed to examining ice, and to walking at a regular pace, and it is natural that this guide should be chosen from among the men of the third detachment which marches at the head. This detachment will have the disadvantage of having only two men to guide four sledges, but, on the other hand, it will have the best dogs, and must set others the example of work.

We get ready the thirteenth sledge which is to accompany and furnish us with provisions for the first two days of the march. It will be led by Captain Evensen, with the Norwegian sailors Ole and Hans. Its load is composed of :—

	lb.	oz.	dr.
A bag with butter, Liebig's Extract, and milk	16	8	8
A case of meat, with Italian paste, vegetables, biscuits, and groceries	68	5	7
Pemmican for the men (thirty full and ample rations)	24	4	0
Pemmican for the dogs (218 rations) with the cases	254	10	1
A sleeping-bag, with three jackets	68	5	7
A gun	9	14	11
Cooking-stove, lamp, a gallon of petroleum (fifty rations), and cartridges	50	11	4
A tent	33	1	1
Spare clothing, smaller outfit for three persons	19	13	7
A lantern, twelve candles, and three ice-axes	15	6	14
Two spare sledge under-runners for the expedition	12	1	15
A sledge	44	1	7
	<u>617</u>	<u>4</u>	<u>2</u>

During the past few days the dogs have been chained up before noon, and tethered to steel wire ropes, stretched by stakes before

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the tents. About ten of them, which show more reluctance to let themselves be caught, are shut up in a kennel and chained there as an additional precaution. One of these for the last three months would not let any one come near it, and was therefore never harnessed to a sledge ; another was pursued for three days ; others attempt to bite as soon as any one tries to take them by the collar. These dogs are not yet well trained, but after working, and being more frequently with us, they will no doubt soon be cured of their wildness, at present apparently untamable.

In the evening, about six, after serving out the pemmican, we let loose all the dogs chained up, in the open ; then they bark with delight, jump about and race madly ; for half an hour there is a regular pandemonium ; then they go to eat their pemmican, which few of them care to do while chained up ; they quarrel about it as is their wont, and, while two or three are fighting for the same piece, there are unfortunately others all round them, unperceived by the combatants, who carry it off. They really seem to think that a mouthful tastes better if snatched away from a comrade.

On the 17th there is a heavy fall of sleet driven by a westerly wind, which shifts to the north, then to the north-east, and falls towards evening. On account of the bad weather the dogs were not chained up, and as they were not watched during dinner, they took advantage of the occasion by tearing in pieces one of their fellows, which luckily was not one of the biggest. We made use of the victim to practise dissection ; it was easily cut up into eleven rations, which were given to the dogs before the pemmican was served out. But none of them would touch them, and all those which had run up, thinking, perhaps, to find some dainty, went away with signs of great aversion as soon as they had sniffed at the flesh.

Sunday, February 18th, dawns at last ; it is the eve of our



The Co. of Spartans towards the Pole

departure. In the morning all the lashings of the sledges are examined, and all the dogs tied up. Captain Evensen and two Norwegians go to ascertain if it is possible to cross over to the ice-pack by going round Cape Säulen, and he comes back at mid-day with the truly disheartening information that a large channel has been opened along the coast towards the north, as far as the eye can see.

After dinner I go with Petigax, Stokken, and Andresen to Cape Germania. The ice-pack, which before noon was intersected by channels, is now much less open ; and, though the channel between it and the coast is fully 200 yards wide near the cape, it becomes narrower as it goes northwards. While I go back to the hut, Petigax and Stökken examine the side of the glacier, which forms the backbone of the island, to see if it is easy to cross it with sledges.

In the hope that some favourable movement of the ice may take place during the night, three plans for our departure have been formed :—

(1) If the ice-pack comes up to join the ice in the bay, we shall start at once from here and march towards the west, so as to get as far as possible from the island.

(2) If the ice-pack comes up to any point on the coast between Cape Germania and Cape Fligely, we shall first bring seven sledges with all the men across the height of Cape Germania up to this favourable spot, and then the six others, and perhaps go down on to the pack that evening.

(3) If, finally, the ice-pack still remains far from the western coast of the island, we shall pass from the height of Cape Germania to the summit of the glacier which forms the central ridge of the island, proceed along it as far as Cape Fligely, and from there descend on the ice-pack towards the east, where it is certain to be always joined to the coast.

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It is true that three or four days would be lost in carrying out this last plan ; but, on the other hand, it is not advisable to wait for a movement of the ice, which might be delayed for fifteen or twenty days.

Before supper everything is definitely settled for starting tomorrow. Instead of giving the usual moral instruction after the Sunday prayer, I bid His Royal Highness farewell in the name of the men of the sledge expedition. After supper all the compasses are adjusted, and we write our last letters to our families.

What a crowd of thoughts invade the mind in this short period of calm, in which it can concentrate itself on the thought of home and of all the loved ones whom one may be leaving behind ! Waking dreams present to the mind visions in which memories of the joys and sweet sorrows of family life are mingled ; the features of those we love follow each other vaguely and dreamily, and, so lively is their remembrance, that it seems as though they were close around us. Some insignificant matter, a sound, a word from a comrade cruelly dispels the dream, and the pen turns again to the hard task of expressing a farewell in which the soul refuses to believe !

The sky is glittering with stars, the air is calm and pure, but to the west the menacing dark tint, which indicates open water, stretches beyond the *moraine* in the direction of Cape Säulen.

Monday, February 19th.—On opening the regulating chronometer I find between its two covers a note from my betrothed. It is an affectionate greeting, which drives away my weariness, and that torpor which follows a prolonged strain on the nerves. Now I feel tranquil, and my head is free. If any one were to probe my mind, not the smallest trace of uneasiness would be found in it, nor could it be suspected that I am fully aware that I am about to begin one of the most important epochs of my life. I feel strong and

ready, I have confidence in the future, and I am certain that I shall come back.

Andresen, Stökken, and Torgrinsen went at seven o'clock to Cape Säulen. Torgrinsen returned shortly after eight to tell me that it is not possible to turn this cape, as there is still open water all round it. The two others went on to Cape Germania, and will bring me the result of their exploration before I reach the hill with the sledges



"WE HARNESSSED THE DOGS"

As we are unfortunately obliged to abandon the first plan for our departure, which was also the easiest, we must now attempt to reach the ice-pack between Cape Germania and Cape Fligely.

Meanwhile, after rolling up and putting away our bags and our camp-beds, we breakfasted, and then harnessed the dogs to seven of the sledges. At nine o'clock precisely, while the light is still feeble, half of our train sets off, helped by all the men, two to each sledge.

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Just as we reach the foot of the ascent, a stiff breeze sets in from the north-east and raises a snowdrift, which is very disagreeable. The dogs lose courage and we cannot proceed ; after toiling for an hour, we barely do 200 yards of the ascent. I then send all the men to two of the sledges, and we thus succeed in bringing them to within a third of the upper table-land, to a point which we must reach, whether we intend to mount to the summit or whether we find it better to descend the hill on the northern side.

We go back to the foot of the descent with the dogs of the two sledges, and try the experiment of harnessing them on to the others, but hardly hoping to obtain a good result, as the teams would be so large, and therefore still more unruly. On the contrary, in spite of the snowdrift, the sledges thus drawn by sixteen dogs each, ascend the steep incline almost without the help of the men, and at mid-day nine of our conveyances are drawn up on the table-land.

In the meantime, Andresen and Stökken, with their faces swollen in consequence of the many times they were obliged to rub them for each other with snow, come back from Cape Germania, where they have been able to see very little, on account of the thick fog and the heavy snowdrift. There is, therefore, no hope of being able to reach the ice-pack to-day—a hope which, indeed, had been much diminished by the difficulties encountered in this morning's march.

While on our way back to the hut, it is very hard at first to restrain the dogs, which, being free from the weight of the sledge, excite each other, and try to run away and drag the men after them. One team escapes, and runs so fast that one of its dogs, weaker and less nimble than the others, is half strangled. We stop them, loosen the poor brute, and leave it for dead ; but it soon recovers, and comes back to the hut, where it is immediately put to work again.

The four other sledges are brought up to the table-land in the afternoon, and, after seeking out and mending some slight damage to the harness and traces, we cover them up with tarpaulin and re-descend. Lest some wandering bear should attack our stores, we leave two dogs tied to an ice-axe fixed to leeward of the sledges to satisfy his hunger. They are two sickly dogs which it has been decided not to take with the expedition, because they are absolutely useless, and in this way their presence will free the men, who are already very tired, from mounting guard. Of these two victims thus offered as a sacrifice, one succeeds in escaping at night, and comes back to the hut, and the other is found safe and sound on the following day.

We lie down to sleep that evening very willingly and rather content. Some mishaps are of use ; our ill-success to-day will serve to prepare us all for our long march.

Tuesday, February 20th.—At half-past eight, when it is just dawn, while we are tying up the dogs to go back to the sledges, a bear-cub, waddling along slowly in the comical way peculiar to bears, comes up as far as the hut of the magnetic instruments. It is welcomed by frantic yells from our 108 dogs, which are on the point of open rebellion. I foresee that the day will be lost. If one team gets loose, the greater part of the dogs will break their chains and their ropes, and it will require more than half the day to catch them again. Luckily, however, the bear is frightened by all this uproar and by two shots. It withdraws, and we are able to proceed with our work.

We leave shortly after, one by one, for the hill. Andresen and Stökken, who went at an early hour to Cape Germania, bring me back rather favourable information about the ice-pack. It has not receded, and it seems possible to reach it at three or four miles from the Cape.

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About half-past nine I set out, with the first three sledges, and cross the table-land on the hill. As the snow is so hard, it is very difficult to hold back the sledges during the descent and prevent it from becoming too rapid. I go back, therefore, to make the other sledges pass higher up along the slope of the glacier; their deviation is very fatiguing, and does not hinder several sledges from upsetting whilst descending. Much time is again lost, so that it is only about four o'clock, when darkness is setting in, that, after seven hours of ceaseless toil, the sledges are at the foot of the hill, on a wide stretch of level ground.

If we pitched our camp there, it would involve the consumption of a day's provisions, whereas if all the dogs were brought back to the hut, more hard toil and fatigue would be necessary next day to bring them out again. It is, therefore, decided that two men shall stay to watch the stores and the dogs, and that the others may go back to sleep another night on their camp-beds. The dogs are tied by teams to their steel wire ropes. Petigax and Fenoillet put up the tent and get ready to pass the night there.

It is already quite dark when I reach the hut with the other men at six o'clock. They are very tired, but, as on similar occasions in the course of my life, I have been able to verify again to-day how plucky, persevering, and capable of enduring fatigue are the Italians.

We have drawn a load of three tons and a half, over a height, to a distance of more than three miles—about twice as much work as we did yesterday. My pedometer marks 48,000 steps from the start till my arrival at the hut, and this may give some idea of how much going backwards and forwards there was during the day.

Wednesday, February 21st.—At night, the temperature fell to -37° C., and this morning it hardly rose one or two degrees. We left the hut at eight o'clock, and at nine were at the tent, where

Petigax and Fenoillet were already harnessing the dogs. All the men of the expedition are impatient to reach the ice-pack, where it seems to us as though we should almost find rest after the exasperating toil we have undergone, while crossing the heights of the glacier during the last two days.

At half-past ten, with thirteen sledges drawn by 108 dogs, we set



"ON SEEING US GOING AWAY . . ."

off in a long line across the level ground which lies in front of us, and follow the coast at about 1,000 yards from the sea. Petigax and Andresen started about half an hour previously, to look out for a point where we can go down to the ice-pack which, it seems to us, we see joined to the island a few miles more to the north.

There is at first a little irregularity in the train, as some sledges leave their place in the line, whilst others stop because something has

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gone wrong, and the men are not yet accustomed to march in column with this sort of vehicle. But their gait improves every day, little by little, and they soon advance at a good rate.

At noon His Royal Highness, who has accompanied us, shakes hands with us and returns to the hut from which we are certainly over seven miles away, a long distance for one who has to carry his arm in a sling. In seeing us go away, his great regret not to be at our head must have been still more intense, and although he was prepared for this moment it must have been a cruel pang for him to feel that the youthful dream of his noble and daring spirit had come to naught.

While he ascends the hill we stop to bid him a last farewell ; and that shout which moistens the eyes of the soldier of the sea when he is far from his country, by reminding him of all that is dearest to him, resounded three times : “Long live the King !”

Our Prince waves his cap, and we go on our way towards a point of the coast where we see Petigax and Andresen making signs to us.

We lose a little time crossing some crevasses, and at half-past one we begin to let the sledges down on the ice-pack by an incline which the guides have quickly made on the ice. In half an hour the thirteen sledges have passed over to the floating ice. We bid good-bye to the Norwegians, who have accompanied us until now, and the train of sledges advances quickly over the ice, but is obliged to make many windings in order to avoid the lines of pressure.

In these first moments we all experienced a great feeling of relief, at having at last been able to get away from a land which seemed as though it would never allow us to leave its shores. The endless space of the sea is now before us, and we are at the beginning of our undertaking. I believe that during all our expedition we had never felt greater hopes of reaching a very high latitude, than when we first



Barentz

NORTHBROOK ISLAND, SEEN FROM DE BRUYNE SOUND

Camp Eden

stepped upon that frozen plain where so much suffering and so much grief awaited us.

Towards the north and the north-east there stretches a field of old ice, which seems rugged and very hard to cross ; we trend towards the north-west, over newly formed ice, covered with a saline efflorescence resembling very minute ferns ; it is like an immense white meadow, across which our sledges glide, leaving two shining tracks behind. But although this efflorescence of the ice is very pretty, it hurts the dogs' paws, and offers much resistance to the runners of our sledges, which we are continually obliged to push along. We make good progress for all that, and Prince Rudolph Island grows perceptibly smaller.

The temperature seems to have fallen still lower. One after another the men have put on the Jaeger jackets which in the morning made them sweat.

About half-past three we sight Cape Fligely nearly to our east ; darkness is coming on ; both the men and the dogs are weary, and it is time to encamp. We draw near to the boundary of the old ice, to look for a sufficiently extensive level space where we may raise our tents, but cannot find any, and as we have before us a high and rather broad ridge, separating the old ice from the new, over which we could not carry the sledges without great difficulty, we decide on encamping where we are.

None of us knew then what it was to stay long on newly formed ice, and we purchased our experience dearly.

We pitch our camp on a spot where the ice is flat and tolerably thick. The dogs whine and refuse to lie down on this damp, cold, salted ice, with which they cannot even quench their thirst. To get a drink, the poor beasts have to lick the icicles formed by the sweat on their coats. To prepare our supper, we take some snow from the old ice-field.

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It is very cold ; as soon as the thermometer is exposed it indicates -38° C. Towards seven o'clock the ice begins to press on all sides ; nearly all the men are already in their sleeping-bags, and the night is very dark, so that it would be folly to set out at this hour to look for some safer place. The howling of the dogs makes a weird accompaniment to the noise of the ice pressure, which grows louder and louder ; at times, it seems to us that we hear towards the south the distant rolling of a train, and at others the roaring of a stormy sea.

The ice-field on which we are encamped begins to groan, and its circumference bends under the weight of the neighbouring fields which are rising upon it ; if it breaks we are lost ; or, at least, our stores are, and with them all hopes of glory, which to-day were still so bright, will depart. What terribly anxious hours I passed that night, as carrying a lantern, I went round the boundary of the ice-field, watching the progress of its destruction, which seemed inevitable ! And yet we could do nothing but wait. A horrible time of suspense, which wore out our strength more than any stupendous effort could !

The temperature is still falling ; towards midnight it is $-39^{\circ} 5'$, and the dogs continue to howl, the ice to creak and moan, and we to suffer !

Thursday, February 22nd.—The minimum thermometer has reached -43° C. About one o'clock the noise of the ice pressure seems to diminish. I leave Lieutenant Querini, who will be relieved by the doctor, to watch the camps and call the men in case of imminent danger. I go into my sleeping-bag, but my great bodily fatigue cannot overcome the anxiety of my mind.

Towards four o'clock the pressure begins again with greater force ; the ice beneath us groans as though it were under a press, and seems as if about to break up every moment. I leave the tent ; the night is clear, and a faint *Aurora borealis* throws a silvery light over the immense

white expanse which surrounds us ; the men also are awakened by the violent upheaval of the ice.

No light was ever more ardently desired than that which will dawn in about three hours. In the meantime, I think it is better to get ready to start as soon as it is possible to see our way. The dogs are harnessed by the light of the lanterns, a long and difficult operation, as their frozen accoutrements are as hard as wood. And the dogs have



" WE SHAPE OUR COURSE FOR THE MAGNETIC NORTH "

also entangled them during the night, for when they broke their chains they heaped them up with their paws to make beds for themselves. Poor brutes ! They preferred any rag, or piece of paper, or even a tin box, which at that temperature must have burnt them like fire, to the chill and damp of the salt ice ! We find Daz, who was certainly the oldest dog of the whole pack, stiff and dead. Few of the dogs have eaten their ration of pemmican and some have not touched it.

We take our pemmican and coffee under our tents, whilst the dogs, being left alone, gnaw several pieces of their harness, which

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takes fully half an hour to mend as best we can, after replacing some by those in reserve.

Now that the light is beginning to enable us to make out objects, the noise caused by the pressure of the ice has less effect on us. At eight o'clock we can at last set out, and we shape our course for the magnetic north.

We march quickly up to a long pressure-ridge which stretches from east to west and stops our way. We open a pass through it, which we cross by almost carrying our sledges. A stretch of three or four hundred yards of fresh ice; then another ridge, after passing which we can advance for half an hour between two ridges running from south to north by a winding path of the most fantastic appearance. Another difficult crossing, and then others, between which there are rather wide stretches of this year's ice, but sufficiently old and covered with snow, with which the dogs eagerly quench the thirst tormenting them since yesterday.

Nerchia, a small dog, and one of the most sickly, which is tied behind a sledge as it has no harness, allows itself to be dragged along; as it can never repay the trouble of harnessing, I make Ole kill it behind a block of ice.

In spite of obstacles the caravan advances very well, but as soon as it stops to allow the guides to open a way, the dogs try to lie down to shelter themselves from the cold, seize each other and entangle the harness and traces; it is a real hardship to put them in order, as to do so we must take off our gauntlets, sometimes even our gloves, and the intense cold is almost intolerable when standing still. During these short halts we are forced to keep continually moving, and beat and rub ourselves to avoid being frozen.

At two o'clock I give the order to encamp on a snow-covered ridge, where we shall not find salted ice as last night—that salted slush

which passed through the bottom of the tent, soaking our sleeping-bags, and the clothes that should have kept us warm while we slept. We are all rather benumbed with cold; as soon as we begin to unharness the dogs our fingers are frozen, and we have to take shelter under the tents every moment, to rub them lest they should be frost-bitten.

While getting dinner ready for my detachment, I imprudently touch the metal lamp with my ungloved hand, and two of my fingers are frozen. Then, while seeking to remedy the evil, I make it worse, thoughtlessly rubbing myself with snow which is probably at a temperature of about -45° C. Both my hands immediately turn white, and then livid to the wrists. Petigax, who at that moment entered the tent to rub his hands also, called the doctor, and between them they saved my hands by rubbing them violently. The doctor has already had his nose frozen twice in less than half an hour. Ollier, meanwhile, has had a toe frozen, so Dr. Cavalli leaves me to go to see to him.

The thermometer marks -47° C. I had intended to have all the harness mended this evening, and the lashings of the sledges tightened, especially those of the under-runners, which had mostly become loosened, but I prefer to put it off till to-morrow, as I do not wish the men to expose their hands too much in such a cold temperature.

To-day we have covered about seven miles, and I calculate that we must be in $82^{\circ} 6'$.

We take our hot soup with pleasure, although it is made without Liebig's Extract, and drink our tea without milk, the auxiliary detachment having lost both the pots. Meanwhile the men relieve each other to rub Ollier's finger, to which the circulation of the blood can hardly be brought back.

At eight o'clock the thermometer marks -49° C., and a faint

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breath of easterly wind has risen, to which it is really painful and dangerous to remain exposed. At last we enter our sleeping-bags, which are soaked through, but I soon fall into a deep sleep all the same, as I have been working for thirty-six hours without closing my eyes.

Friday, February 23rd.—Last night the minimum thermometer went down to the lowest degree marked, -52° C. Ollier groaned all night, and Captain Evensen had his hands frozen in the sleeping-bag. We have all been more or less frost-bitten on our hands, our noses, or our feet; few of us were able to sleep. Querini, Cardenti, and Canepa have been obliged since yesterday to leave aside their reindeer-skin boots, because they could no longer get them on, and have replaced them by the *finsskos*; the doctor and Ollier will do the same to-morrow. Many of the sledges want to be tied together again, and half of them must have the lashings of the forward part of the under-runners completely renewed; many of the dogs' chains and pieces of harness also require to be mended.

In the present temperature it will be very difficult to do all this work in less than two days; it is not much, it is true, but it is indispensable for the continuation of our journey, for, if we go on thus, all these defects will be multiplied, make the sledges unserviceable and render it impossible to drag them. Besides this, the doctor advises me to send back Ollier, and I do not find it easy to replace him. Ole got a severe blow from a sledge, and limps; Hans has swollen hands. This morning I have to send back Captain Evensen, and I shall remain with only nine men.

If I were obliged to return to-morrow or within a few days while this temperature lasts, the retreat, if not disastrous, would certainly diminish the probability of a new departure, because I should be obliged to abandon some of the sledges, especially if any of the men

fell ill. If, on the contrary, we were to retreat to-day with all the outfit of the expedition still intact, I would be able to start again as soon as everything was put in order.

I therefore assemble in my tent Querini and the doctor, Petigax and Fenoillet, who are the two oldest of the men, and after having explained the situation and heard their opinions, which agreed with mine, I decide on returning to Teplitz Bay.

The sledges are reloaded, and we start at ten. For a good distance we follow the tracks of yesterday, which then become obliterated owing to pressures which took place, probably, during the night, but which we did not feel, and we undergo much fatigue on account of the many channels which cross our way.

About one o'clock we are in front of a broad pressure-ridge, difficult to cross, because the enormous blocks of ice, nine or twelve feet high, which form it, are unstable, and seem as if they were floating in the water, which overflows at every spot where it would be easy to pass with the sledges.

While seeking a place to cross, I slip into the water up to the middle, but I pull myself out at once by crawling on the ice, on which I instinctively flung myself forward in order not to go to the bottom. Before I could stand up my legs, especially the left, were already encased in a stiff tube of ice, which had formed on my trousers and my boot; the water froze so rapidly on touching my clothes, which were very cold, that it had not time to pass through the stuff or the leather of my boots. This was very lucky, for thus I not only escaped having my legs or feet dangerously frozen, but also the necessity of changing my clothes.

We are at last able to open a way through the blocks of ice, through which we haul our sledges. While thus engaged, two bear-cubs, swaying from side to side, sometimes on their hind legs, sometimes

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on all four, approach to within about a hundred yards of our caravan with signs of great curiosity. The dogs go wild as usual ; they yell and make efforts to pursue these white beasts, and in their struggles succeed in moving two sledges which until then had never progressed without our assistance. Querini and the doctor take their rifles ; the bear-cubs run at the first shot, but we see them later watching our march from afar and following our track at a respectful distance.

After some other rather difficult crossings, which we get over quickly enough, and a tedious journey over a belt of new ice in motion, which is splitting up in every direction, we reach the level space opposite that part of the coast of Prince Rudolph Island, from which we had come down on the ice-pack two days before, and I breathe freely on escaping from that labyrinth of floes, creaking under a pressure which since twelve o'clock has not ceased for a moment.

It is four o'clock when we reach the coast, precisely at the inclined way which we had made when we left it. We lift all the sledges up to the glacier by means of ropes.

It is beginning to grow dark, and I know by experience how much time it takes to cross the height of Cape Germania with all our equipment. The dogs are exceedingly tired ; I harness sixteen of them to six sledges, and decide on leaving the other six here, to be taken on to-morrow ; I send a man to assist the auxiliary sledge, which is almost unloaded.

We take over two hours to reach the foot of the hill, and then it requires a strong effort to ascend it ; we have to help the dogs to drag up only two sledges at a time, and as a supreme discomfort the wind blows from the east with sleet, which freezes our hands and noses.

While we are pulling up the last sledges I send Querini to the hut to inform His Royal Highness of our return ; by the time the seven

vehicles are on the level, it is impossible to see anything at a distance of a few yards. I then have all the outfit collected together and the dogs unharnessed, some of which I send forward with Hans and Ole. As I see that the poor brutes have not the slightest wish to run away, I merely have them let loose; they are worn out, and many of them lie down where they are. Followed by the others we go towards the hut, which we reach after eight o'clock.



"THE DOGS ARE EXCEEDINGLY TIRED"

In spite of the darkness, the Prince had gone to meet us, but we had missed each other. When he came back his first word was one of praise, a precious balm to my wounded pride, at the very time when, as all my anxiety with regard to the lives of the men and the fate of the expedition was at an end, it felt the blow most keenly.

And yet I could not but feel pleased with my decision, though it had cost me so much. If we had persisted in advancing with a continuous temperature of -47° , such as has been rarely felt by

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expeditions living under tents, we should sooner or later have been inevitably forced to make a disastrous retreat. Instead of that, after enduring for forty hours a temperature between -43° and 52° C., we have returned with some slight frost-bites, but all in good health, after a march of ten hours without rest, covering over twenty-five miles and saving all our equipment.

Before our stiffened limbs have been reinvigorated by the pleasant warmth of the hut, we are already talking of setting out again, and that as soon as possible.

CHAPTER II

Final Departure of the Expedition

CHAPTER II

FINAL DEPARTURE OF THE EXPEDITION

THE day on which we came back to the hut was followed by a week of bad weather.

If we had encountered this violent storm while on the ice-pack without shelter, it would have caused serious loss, and might have fatally compromised the success of the expedition ; Querini and Cavalli are sent back. we were therefore quite consoled for having been obliged to return.

Meanwhile we busied ourselves with adding to our equipment the improvements which the experience of our short march had suggested to us.

It was first of all absolutely necessary to diminish the loads, in order that the sledges should not suffer serious damage when crossing the broken and difficult ice which seemed to surround the northern part of the island to a considerable distance.

It was now easy for us to diminish the loads, since we thought that it would be superfluous and useless to carry more than seventy-two days' provisions for the third detachment, as it was certain that it could not leave before March 5th or 6th, and that it was absolutely necessary that it should return not later than the middle of May, when the thaw begins. If, moreover, the time during which the first and second detachments were to advance was reduced to twelve and to twenty-four days respectively, the corresponding reduction in

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the rations for the men and the dogs would effect another considerable saving in the weight to be dragged.

On the other hand, we had found out by the way in which they had been prepared that the allowance of petroleum was not sufficient to cook our provisions well ; and as we could not change them, we increased the ration of petroleum and brought it up to 6 oz. 5 dr. for each man.

I had also observed how necessary it always was to send forward at least two men to prepare the way for the caravan ; it was the only way of making rapid progress, and we would now more than ever require to travel quickly, to compensate for the two weeks lost. It was therefore settled that I should take with me an additional man for the first twelve days. The choice fell upon the young engineer, Stökken, who had already at the time of our first departure frequently requested to be allowed to come with us ; Gino Gini, too, was very anxious to do so, and it was certainly he who had the most right to hope for the privilege, both as being Italian and for the capacity he had always shown for work, but serious considerations with regard to the management of affairs at our camp dissuaded us from taking the worthy Gini ; and, much against his will, he calmly consented, as usual, to sacrifice his personal views.

Stökken was placed in the first detachment, and both the sleeping-bag and the tent which belonged to it were immediately enlarged so as to hold four persons instead of three.

Although this increase in the number of men necessitated an augmentation of provisions, clothing and equipment, and though all the men had a larger share of petroleum, yet as the number of days of travelling towards the north had been reduced, there was a saving of 666 lb. on the total weight to be carried, so that the load of each sledge was lightened by more than fifty-five pounds, which was not an

insignificant diminution for the whole convoy, and was very favourable to the preservation of our vehicles.

We had found that the Jaeger clothing absorbed too much moisture, which at a low temperature was soon changed into a regular sheath of ice ; we substituted for it clothes of very thick grey cloth, which had served us very well during the winter. The trousers were made like knickerbockers, and the jacket like an *anoraker*, that is to



A REST BY THE WAY

say, like a smock-frock rather tight at the waist provided with a large hood fringed with wolf-skin ; the sleeves were edged with the same skin. We found it convenient to make these frocks open in front, for if they were closed and tightly fitting we could not have put them on if they became at all stiff.

We also replaced the goats'-hair stockings, which were easily torn, by good woollen ones ; the reindeer-skin boots were exchanged for *fnskos*, and the reserve of clothing was increased by a pair of these

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shoes for each man, to which were added gaiters of the same grey cloth the clothes were made of, to take the place of the legs of the discarded boots.

After long discussions as to the best way of avoiding, at least partially, the great moisture in the interior of the reindeer-skin sleeping-bag, it was at last decided, at the suggestion of Petigax, to take, in addition, the bag of down which each of us had used during the winter.

These were the only changes made in our outfit.

The enlargement of the reindeer-skin sleeping-bag and of the tent, with the addition of clothing and cooking utensils for another man, increased the weight by sixty-one pounds; the ten bags of down weighed sixty-six pounds; and the entire camp equipment and the clothing for the three detachments amounted to 978 lb. 13 oz. 8 dr.

Some further saving was effected in the weight by taking most of the meat and butter out of the tin boxes, and making about a hundred little bags, each containing the daily ration of a detachment with the exception of petroleum and milk. Into these were put meat, butter, pemmican, groceries wrapped up in paper, with biscuits, and a little bag containing the Italian paste and Liebig's Extract, which was easily frozen in balls.

By this method there was not only a saving in weight, but the further advantage that the rations were more easily served out and the meals more quickly prepared. The milk had been given out separately, and each detachment had to regulate its consumption as it judged fit. The petroleum was to be served out about every three days.

The expedition now required:—

For the first detachment, four rations for 24 days, or 96 rations.

For the second detachment, three rations for 48 days, or 144 „

For the third detachment, three rations for 72 days, or 216 „

Total . . . 456

Final Departure of the Expedition 395

As on the occasion of the first expedition, these rations were subdivided among the three detachments in the following manner:—

First Detachment (168 rations).

For the return journey.

	lb.	oz.	dr.
Twelve bags containing four entire rations, with the excep- tion of milk and vegetables	127	13	14
One bag containing forty-eight rations of milk and vegetables			

First, Second, and Third Detachments.

For the first twelve days.

Twenty-four bags containing three entire rations, with the exception of milk and vegetables	297	9	15
Twelve bags containing four rations as above			
Three bags containing forty rations of milk and vegetables .	37	7	10
Three cases of petroleum	83	12	6
	546	11	13

Second Detachment (144 rations).

*For the return journey and for the Second and Third Detachments
(from the twelfth to the twenty-fourth day of their march towards the North).*

	lb.	oz.	dr.
Brought down	546	11	13
Eight bags each holding three entire rations, with the excep- tion of milk and vegetables	59	8	6
One bag with twenty-four rations of vegetables	2	3	4
One bag of preserved milk (seventy-two rations) and Liebig's Extract (forty-eight rations)	8	13	1
Two cases of biscuits, Italian paste, and vegetables (sixty rations in each)	143	11	0
Three bags of meat and untinned butter (ninety rations) .	72	12	0
One bag of meat, butter (thirty rations), milk, and Liebig's Extract (seventy-two rations)	38	9	4
Four cases of groceries of thirty rations each	26	11	4
One case and one bag of pemmican (120 rations)	81	9	0
Two cases of petroleum	56	3	8
Half a case of petroleum	14	5	4

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Third Detachment (144 rations).

Two large cases and one small one of Italian paste, biscuits, and vegetables (144 rations)	lb.	oz.	dr.
	181	4	1
Four bags of meat, butter, milk, and Liebig's Extract (144 rations)	139	15	4
Five boxes of groceries (150 rations)	33	5	1
Three bags of pemmican (144 rations)	98	1	10
Three cases of petroleum (175 rations)	83	12	6
Onions, spirits for lighting, a lamp, matches, tobacco	17	10	3
Total weight of the stores	1,605	2	5

We mended the sledges with great care, and put aside and replaced two *kayaks* which had come to pieces in our short journey by others; we then set about making up the loads, which were very soon got ready, thanks to the experience we had acquired.

The weight to be carried was as follows :—

	lb.	oz.	dr.
Clothing and camp equipment	978	13	8
Provisions for the men	1,605	2	5
Pemmican for the dogs (2,800 rations), including the cases.	3,306	14	10
Four <i>kayaks</i>	220	7	6
Twelve sledges	529	1	11
The lashings of the loads	39	10	14
Two spare bamboo tent-poles	2	3	4
Two spare under-runners	12	1	15
A trace and sixteen spare sets of harness	11	0	5
Three lanterns and candles for ten days	12	1	15
	6,718	9	13

N.B.—In the same way as previously to the departure in February, an estimate was drawn up by which the feeding of the dogs and the arrangement of the loads were to be regulated while on the march. According to this estimate, twelve days after the auxiliary detachment had been sent back, the first detachment should return with two sledges, a load of 698 lb. 12 oz. 13 dr. and twelve dogs; the second detachment was to follow twenty-four days after with two sledges, two *kayaks*, a load of 1,062 lb. 9 oz. 15 dr. and sixteen dogs, whilst the third detachment was to continue on towards the north with four sledges, two *kayaks*, a load of 2,266 lb. 5 oz. 6 dr. and thirty-eight dogs.

These 6,718 lb. were distributed as shown on pp. 398-9

While the sledges were being loaded the harness was mended, and the dogs, which had been let loose while the bad weather lasted, were caught and chained up. Four were missing; one was found buried under the snow; but the three others, though sought for, could not be found; they had probably fallen into some crevasse when hunting bears after our return.

On March 10th the barometer began to rise, and the weather



"WE BEGIN TO HARNESS THE DOGS"

seemed as though about to set fair; everything was ready, so it was decided that we should start next morning. That day there was a bear hunt, which caused some excitement, and coincided with the appearance of a large walrus. The result of this adventure was that four dogs were wounded, one very severely, and just at that time the bear's skin, though a splendid one, was not worth such a sacrifice. Our dinner table was turned into an operating table, on which the

	THIRD DETACHMENT								SECOND							
									THE NUMBER							
	1		2		3		4		5		6					
	lb.	oz. dr.	lb.	oz. dr.	lb.	oz. dr.	lb.	oz. dr.	lb.	oz. dr.	lb.	oz. dr.	lb.	oz. dr.	lb.	oz. dr.
Sledge	44	1 7	44	1 7	44	1 7	44	1 7	44	1 7	44	1 7	44	1 7	44	1 7
Kayak	55	1 12	55	1 12	—	—	—	—	55	1 13	55	1 13	55	1 13	55	1 13
Pemmican for the dogs	200	2 4	260	2 4	233	11 0	260	2 4	260	2 4	260	2 4	260	2 4	260	2 4
Pemmican for the men.	46	4 11	52	14 8	40	4 11	—	—	37	7 10	—	—	—	—	—	—
Biscuits, Italian paste, and vegetables, in boxes.	—	—	—	—	182	15 11	—	—	—	—	—	—	—	—	—	—
Groceries (tea, coffee, sugar, and salt)	—	—	33	1 1	—	—	—	—	13	3 10	13	3 10	13	3 10	13	3 10
Meat, butter, milk, Liebig's Extract, in bags	—	—	105	13 2	35	8 5	—	—	—	—	—	—	—	—	—	—
Meat and butter, in bags	—	—	—	—	—	—	—	—	28	10 8	44	1 7	—	—	—	—
Milk, vegetables, and Liebig's Extract, in bags	8	13 1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bags with three entire rations (except milk and vegetables).	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bags with four entire rations (except milk and vegetables).	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Petroleum	—	—	—	—	—	—	83	12 6	—	—	—	—	—	—	—	—
Sleeping-bags, with jackets and bags of down	—	—	—	—	—	—	85	15 10	—	—	—	—	—	—	—	—
Tent	—	—	—	—	—	—	33	1 1	—	—	—	—	—	—	—	—
Clothing	72	12 0	—	—	—	—	—	—	72	12 0	97	0 0	—	—	—	—
Cooking-stove and mess-tins	15	6 14	—	—	—	—	—	—	15	6 14	—	—	—	—	—	—
Medicine-chest and bottles of rum or cognac	11	0 5	—	—	—	—	—	—	11	0 5	—	—	—	—	—	—
Case of instruments	—	—	—	—	—	—	35	8 5	—	—	—	—	—	—	—	—
Rifle or gun	—	—	9	14 11	—	—	8	13 1	—	—	9	14 11	—	—	—	—
Ice-axes.	—	—	—	—	13	3 10	—	—	—	—	—	—	—	—	—	—
Extras ⁶	35	8 5	—	—	—	—	—	—	19	13 7	30	13 13	—	—	—	—
Spare under-runners	—	—	—	—	—	—	12	2 0	—	—	—	—	—	—	—	—
Spare bamboo tent-poles	2	3 4	—	—	—	—	—	—	—	—	—	—	—	—	—	—
The lashings of the loads	3	4 14	3	4 14	3	4 14	3	4 14	3	4 14	3	4 14	3	4 14	3	4 14
Total	554	10 13	564	5 11	559	1 10	566	13 0	561	0 12	557	11 13	554	10 13	564	5 11

¹ The cooking-stove of the first detachment was packed up in the case of instruments, which was enlarged.² 187 lb. 6 oz. 4 dr. too little.³ 187 lb. 6 oz. 4 dr. too much.⁴ Comprising milk, vegetables, and stores for the return journey.

Final Departure of the Expedition

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DETACHMENT						FIRST DETACHMENT						TOTAL	AUXILIARY SLEDGE
OF THE SLEDGE													
7		8		9		10		11		12			
lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.	lb. oz. dr.
44 1 7	44 1 7	44 1 7	44 1 7	44 1 7	44 1 7	44 1 7	44 1 7	44 1 7	44 1 7	529 1 4	44 1 7		
—	—	—	—	—	—	—	—	—	—	220 7 2	—		
260 2 4	260 2 4	—	—	354 15 1	354 15 1	354 15 1	354 15 1	354 15 1	354 15 1	3,119 8 5 ²	211 10 4		
46 4 11	46 4 11	92 9 7	—	—	—	—	—	—	—	368 2 11 ³	—		
143 4 12	—	—	—	—	—	—	—	—	—	326 4 8	—		
—	—	—	—	—	—	—	—	—	—	59 8 6	—		
—	—	38 9 4	—	—	—	—	—	—	—	179 10 12	—		
—	—	—	—	—	—	—	—	—	—	72 12 0	—		
—	11 0 5	20 7 7	—	—	—	—	—	22 0 11	—	62 13 4	—		
—	—	—	127 13 14	57 5 1	57 5 1	57 5 1	57 5 1	57 5 1	57 5 1	242 8 1	105 13 2 ⁴		
—	—	116 13 8	30 13 13	41 14 3	41 14 3	41 14 3	41 14 3	41 14 3	41 14 3	231 7 11			
56 3 7	14 5 4	—	—	56 3 7	56 3 7	56 3 7	56 3 7	27 8 14	27 8 14	233 1 9	—		
—	83 12 6	112 6 15	—	—	—	—	—	—	—	282 3 0	66 2 3		
—	33 1 1	46 4 11	—	—	—	—	—	—	—	112 6 15	33 1 1		
—	—	—	—	—	—	—	—	—	—	242 8 1	39 10 14		
—	—	17 10 3 ¹	—	—	—	—	—	—	—	48 8 0	—		
—	—	11 0 5	—	—	—	—	—	—	—	33 1 1	—		
—	33 1 1	44 1 7	—	—	—	—	—	—	—	112 6 15	55 1 13 ⁵		
—	19 13 7	9 14 11	—	—	—	—	—	—	—	58 6 12	9 14 11		
6 9 13	6 9 13	3 4 14	—	—	—	—	—	9 14 11	9 14 11	39 10 14	6 9 13		
—	—	—	—	—	—	—	—	—	—	85 15 10	—		
—	—	—	—	—	—	—	—	—	—	12 2 0	—		
—	—	—	—	—	—	—	—	—	—	2 3 4	—		
3 4 14	3 4 14	3 4 14	3 4 14	3 4 14	3 4 14	3 4 14	3 4 14	3 4 14	3 4 14	39 10 8	3 4 14		
559 15 4	555 8 9	560 9 1	561 1 1	557 12 1	561 0 14	561 0 14	561 0 14	561 0 14	561 0 14	6,719 9 10	575 6 2		

⁵ Comprising cooking-stove, mess-tins, and a supply of petroleum.

⁶ The extras comprised everything not specially mentioned in this table: such as alcohol to light the lamp, compressed onions, matches, lanterns, candles, spare sets of harness, ropes, needles, thread, etc., etc.

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doctor, with our united help, sewed up the wounds inflicted on our dogs by the bear's claws or the walrus's teeth.

The north-west winds of the previous week had brought the ice-pack close up to the island, even on the western side, and between it and the fixed ice of Teplitz Bay a crust of ice, which we hoped might be able to bear the sledges, was now being formed. That evening we wrote our last letters to our families, and made all arrangements necessary for our definite departure.

Sunday, March 11th.—At eight o'clock, after an ample breakfast, we begin to harness the dogs. One of those wounded yesterday is in such a bad state that it is of no use ; there remain, therefore, 103. As the sledges of the third detachment have the best dogs, we harness only seven to each, while nine are harnessed to some of the sledges of the first detachment, which has the smallest and weakest of the animals.

At a quarter to nine I give the order to set out. We cross Teplitz Bay, following its northern coast-line. At Cape Säulen we find the new ice thin, but strong enough to bear our caravan, and we pass over it daringly, going towards west-north-west, so as to get as far as possible from the coast and reach the old ice-pack at a spot which, from this distance, seems better than the rest.

The saline efflorescence formed upon the new ice causes the dogs much fatigue, and the men are forced to harness themselves to the sledges to help them. The train, however, advances quickly, in a long file, at the head of which, accompanied by His Royal Highness, I march.

About eleven we reach the old ice, which is very rugged ; the Prince assists at the first encounter of the train of sledges with the pressure-ridges, then bids us farewell and retraces his steps.

We feel this parting much more than when we set off in



Albatross

The Expedition leaving the Bay of Hvalby

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February. We now leave with a better knowledge of what awaits us—of the hardships, and of the great and innumerable difficulties which we shall have to surmount—and our chief, who is well acquainted with all these obstacles, knows that we shall not return until all our resources and strength have been exhausted. We do not now take leave of each other with enthusiasm, under the false impression that we are about to win a complete and easy victory ; though we do not express our thoughts, both the Prince and ourselves entertain only the hope that in the arduous struggle with the Arctic sphinx we may surpass our predecessors.

It is extremely difficult to travel on the old ice-pack ; we have to stop every 200 steps and work with our ice-axes. The weather is fine, and a light breeze blows from the south-south-east, with -33° of temperature—two degrees lower than on the island. In spite of this, we are all in a perspiration from the toil of passing the sledges through the openings made by the guides in the pressure-ridges.

Shortly after noon we sent back the Norwegians, who do not form part of the convoy, and it has therefore become more fatiguing to help the sledges along.

I would have wished to encamp about three o'clock, but a broad channel lay before us, and we crossed it ; we then met with another, and crossed this, too, in order not to remain between them, so that it was almost four o'clock when we pitched our tents. Men and dogs were all very weary, but in excellent health ; we take the bearings of Cape Säulen to the south-east, and of Cape Fligely to the east. At six o'clock we are in our sleeping-bags, where we pass an excellent night.

Monday, March 12th.—The men were called at half-past five, and it took us three hours to make ready to start. We find some difficulty in getting over several channels ; some which were frozen

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only last night cannot be crossed, and others which froze yesterday are covered with rather weak ice.

While crossing one of these latter, which was rather wide, a sledge sinks in it, perhaps through the negligence of the man who accompanied it. It does not sink suddenly, but very slowly, beginning at the hinder part of the sledge. I call out to the man to stand aside, so as not to increase the weight on the surrounding ice, and then, creeping up to the dogs on our hands and knees, we tie a rope to the end of the trace, which four or five of us, standing more than three feet from each other so as to distribute our weight over several parts of the ice, lay hold of. We thus prevent the ice from breaking, though it bends under our feet, and are able to easily draw the sledge upon stronger ice.

I was not displeased at this little incident, because it helped to convince the men that the precautions which I obliged them to take when crossing thin ice, especially when of great extent, were not excessive. I always sent on ahead a man whose duty it was to stop wherever the fresh ice could bear, and as there the ice generally formed a step, over which it was sometimes difficult to bring the sledges, the man had to prepare a slight incline with his ice-axe. I then sent forward a sledge, followed at three feet distance, at least, by a man who was never to walk beside it, in order not to increase the weight on the ice; the other sledges followed at twenty or thirty yards from each other, and when I thought the thinness of the ice really dangerous, I never allowed one sledge to cross until the preceding sledge was in safety on the other side of the channel. The column only went on after we had all crossed.

It is true that this took up some time, but we thus avoided mishaps which might easily have happened to so large a caravan, and never met with an accident even when crossing wide expanses of

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ice so thin that it bent under our feet, as though it were a bridge of long thin planks. And in spite of the delay caused by this method of crossing these belts, we saved a great deal of the time it would have taken to go round them.

I do not know if it is because the temperature has risen above -30° , or if it is on account of the pemmican, to which they are not used, but the men complain much of thirst. I therefore order a short halt at noon, during which some tea is served out, which is naturally



"AN EXPANSE OF NEW ICE"

deducted from the daily ration. At one we continue our march towards the north, and find more channels newly frozen over, and pressure-ridges lying perpendicularly to our route. We have begun to feel used to these obstacles, and advance rather quickly in spite of them.

Snow begins to fall about half-past two ; it is light and does not inconvenience us, but on the other hand an expanse of new ice which stretches over a mile and a half fatigues the dogs very much, as well as the men who are obliged to help them. At half-past six I give

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orders to encamp, although we have not yet completed the eight hours' march I had intended.

We take the bearings of Cape Fligely at 100° , and of Cape Germania at 170° . The temperature in the evening is -28° , and it falls during the night only to -31° .

Tuesday, March 13th.—I send back the auxiliary detachment with a sledge drawn by five dogs, among which are the few females of the pack, and ninety-eight remain with us. Captain Evensen wishes to still accompany us for a short distance to give some further help. At eight o'clock we march.

Since yesterday morning, whenever the ice allows, we tend towards the magnetic north, a direction which will bring us much more to the east of the meridian of Teplitz Bay; this voluntary deviation will help in some degree to compensate that which the current certainly causes us towards the west. I have founded this calculation on the mean driftage of the *Fram* during the months of March and April. The movement of the ice not only varies from one year to another, but also according as the latitude is higher or lower. The data, therefore, which we had concerning the matter, could only serve to form a general opinion. As soon as the sun is higher, a calculation of the longitude will easily furnish the necessary correction which will prevent our route from deviating too much from the meridian of Teplitz Bay. Meanwhile we are guided towards the north, as indicated by the compass. It would naturally be impossible to ascertain its exact direction while marching, on account of the vibration caused by each step. We regulate our course by the sun, or rather by the shadow we cast, or by fixing our eyes on points where the ice presents striking features, which we take care to note from time to time. We thus find it easy to keep the train of sledges in the general direction on which we had decided.

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To-day the ice-pack seems better than during the last two days ; wide level stretches and fewer pressure-ridges give us hope that we have passed the most broken and difficult part of the ice. And thus, when Evensen and his men take their leave of us, I am able to send His Royal Highness a favourable report.

At noon I verified the variation of the compass, which seemed to me to be greater than that calculated at Teplitz Bay. This makes me suspect that we have gone more to the east than we thought, but I cannot have much confidence in my observations, which were taken with great inconvenience and not much precision, and I therefore continue to go on steadily towards the magnetic north.

We halt towards five in the afternoon, reckoning that we have travelled from nine to ten miles in the right direction. Yesterday we did only seven. We are still below the average we expected, but our hopes have been revived by meeting with a surface over which it is easier to travel, and by finding our strength, as it were, renewed. We all feel this evening less weary than yesterday, although we have worked for nine hours consecutively ; even the dogs seem less tired.

Wednesday, March 14th.—To-day is the *festa* of His Majesty the King. As soon as we awake we hoist on the poles of our tents the little national flags with which each detachment is furnished ; they wave in the light north-westerly breeze, which makes us feel the low temperature still more. Last night the thermometer fell to -43° , and at eight this morning it marks -38° . It is a disagreeable temperature for working in the open air, even for those who, like us, have already been exposed to one somewhat lower.

We hope to warm ourselves by marching, but as soon as we start we meet very bad ice, which stops us. It is an endless plain, covered with great jagged blocks of ice which seem as if they had been thrown there confusedly, by the hand of a giant, to prevent

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us from passing, and we are forced to open out a way by means of the ice-axe. The four guides work ahead of us, and we push the sledges through the narrow path, which they make with a rapidity which would seem incredible to those who have not seen these men at work. We then meet with a long channel trending towards the north-north-west. It has been frozen for some days and affords an easy and smooth road, which we follow, and for about half an hour it appears as though we are walking in the bed of a white torrent bordered by sparkling crystal rocks; but when the channel ends, all too soon, the work with the ice-axe begins again and lasts for several hours.

After mid-day we meet another channel, which runs almost north-west; nevertheless, it suits us better to follow it than go on towards the north, and so we advance slowly through those rugged pressure-ridges.

When we encamp that evening about four o'clock, we find that though we have walked and toiled for more than eight hours, we have hardly advanced three miles and a half towards the north. We are weary and benumbed with the cold, which apparently is about to become more intense; at five o'clock the thermometer marks -43 . We again unfold our little flags, and I distribute some chocolate that I had secretly brought with me for this occasion. It was the only *extra*, the only sybaritic luxury which we allowed ourselves in the course of the sledge expedition.

I have found that the column of mercury in the minimum thermometer has been broken, and have vainly tried to reunite it by the heat of the flame of a candle.

Canepa, while trying to break his butter with the point of his knife, cut his wrist, but luckily not deeply. I reprimanded him severely, for I continually warn the men above all things to avoid

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with the greatest care any injury to their persons. A man unable to work would be one of the greatest misfortunes which could befall the expedition; it is absolutely necessary, if we are to make any progress, that we should all co-operate to the utmost of our power.

In spite of the chocolate, we all feel vexed this evening at our poor day's work, and the frost, which pursues us even into the



"AND WE ARE FORCED TO OPEN OUT A WAY BY MEANS OF THE ICE-AXE"

sleeping-bag and prevents us from sleeping, certainly does not help to put us into good humour,

Thursday, March 15th.—At eight o'clock, when we were about to start, the thermometer marked -44° ; but we warmed ourselves a little while crossing a rather extensive level plain. At the end of this rose a long chain of *séracs*, which at first sight seemed easy to pass, and into which we entered in order to gain another plain,

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lying towards the north-east, but we had to toil severely for more than two hours in order to cross it. We then travelled at a moderate rate towards the north, at first for an hour over new, and then over old ice, not very rugged, meeting with few pressure-ridges and no channels; but the bitter cold, intensified by a strong breeze from the north-east, tires us more than marching, and I find myself obliged to encamp towards half-past three, that the men may finish unharnessing the dogs before night falls.

Although the sun does not give much warmth as yet, there is, nevertheless, a sudden sensation of chill when the star of day disappears below the horizon. At four o'clock the thermometer marks -40° , at half-past five -45° , and the wind still blows from the north-east. To-day we have travelled about seven miles towards the north.

In crossing the pressure-ridges the bow in front of one of the sledges of the second detachment breaks; the want of this renders it more difficult for the sledge to surmount the little inequalities of the ice; when there is a decline, the points of the runners now become liable to stick in the snow or in rough places, and it is very fatiguing to extricate the sledge and send it on its way again. The bow, which is of strong cane, was broken, partly through the carelessness of the man who accompanied the sledge, and partly on account of the low temperature, which renders wood as fragile as glass, especially when slightly damped.

Before making the soup I again tried to reunite the column of mercury of the minimum thermometer, and this time I succeeded in doing so; but in the hurry of doing my duty as cook, instead of keeping the thermometer for a long time near the cooking-tin, I imprudently laid it down on the sleeping-bag; there was at once a sharp report, like a pistol-shot, and it was impossible to find the

bulb, which had been violently detached from the tube. I regretted the accident very much, as I only possessed one of these thermometers, the only kind which indicates the temperature with precision while we are encamped. When the temperature is below -30° , and it is impossible to employ a diaphragm or a magnifying glass, the mere fact of approaching to read the gradations on the tube of an unmounted thermometer sends it up a couple of degrees. When the temperature is below -50° , to go near an unmounted thermometer causes a difference of three, or even four, degrees. I verified this fact during the month of February, by frequently comparing the indications of an unmounted with those of a minimum thermometer exposed to the air for a few minutes and brought back to its normal position each time.

That evening we found our down sleeping-bags frozen as hard as wood. Two men had to pull them so as to stretch them, and even then it was hard work for us to slip into them. We succeed at last in getting into the reindeer-skin bag—not to sleep, but to feel our teeth chattering for hours. Our feet are the only part of our bodies which cause us no suffering; they are warm when our day's march is ended, and as we immediately take off our shoes and put on the long Jaeger stockings, they remain so—that is to say, relatively to the rest of the body, which is completely benumbed. There are patches of ice on our knees like horses' knee-caps, and we have others, both large and small (sometimes thick enough to be scraped off with a knife), everywhere, but especially on our cheeks, on our backs, and in all places where the perspiration has oozed through.

After being some time in the sleeping-bag, all the ice sticking to one's clothes begins to melt, and in spite of the want of air, which renders the interior of the bag suffocating, one has a sensation which

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bears a distant resemblance to comfort ; one is naturally very damp, but it is possible to fall asleep without our teeth chattering.

Friday, March 16th.—The intense cold made us pass a bad night ; the temperature must have fallen below -52° or -53° . At 6.30 a.m. the thermometer still marked -50° , and, in spite of the goodwill shown by all of us, it took a long time to harness the dogs and raise the camp. We have come back to the hardships and the difficulties met with in our march in February, and this state of things causes me much anxiety. Last night one of our best dogs, called Basket, had one leg, which had been entangled in his chain, frozen ; we harness him all the same, and the poor brute continues to pull with goodwill on three legs.

We are not able to start till nine o'clock. We luckily find ice which does not present too much difficulty, but enables us to accomplish from eight to nine miles towards the north.

The tracks of bears in that direction have been seen ; these, as well as the many large patches of new ice, are proof that there must have been much open water in these regions in the beginning of March.

We meet with a few pressure-ridges, through which Petigax and Fenoillet quickly open a way. Even these short stoppages cause us much suffering ; we have to take advantage of them to put in order the dogs, the traces, and the lashings of the sledges ; to do this we have to take off our gauntlets, and the cold stings our hands through our gloves. Mine are in a deplorable state from previous frost-bites ; they cause me continual suffering, which only ceases when I am walking. I have not a finger the end of which is not excoriated, and as soon as I stop and work standing the pain begins again. Will this intense cold never cease ? We only ask of Heaven that the temperature may not fall below -35 , and

our prayer seems to us very modest! But when the column of mercury in the thermometer, as now, never rises, even in the middle of the day, above -45° , to live safe and sound requires a struggle, and our moral and physical energy seems at the point of exhaustion each moment.

The sentiment of duty, the necessity of working, and the presence of our comrades do much to sustain us; but I believe that if a man were left alone under the present conditions, he could hardly fail to despair, and a moment of despair would mean eternal slumber.

There is but a single moment of relief during the day—one short interval—of which, I believe, we all think frequently and with pleasure during the march; it is the dinner-hour.

When the order to encamp is given, Petigax, who is in front, chooses a suitable spot and stops the first sledge, near which the three other sledges of the third detachment are drawn up at a distance of about ten feet from each other. The sledges of the second detachment also stop according as they come up and form a second line, whilst those of the first detachment form a third line. The tents are pitched between two sledges, generally those in the centre; their side ropes are fixed to the runners of the sledges, and those at the ends to an ice-axe stuck in the ice, or to a sledge of the detachment in front or in the rear. The sleeping-bags are then unpacked, the cooking-stoves taken out of the *kayaks*, and everything arranged beneath the tent.

The small steel wire ropes to which the dogs are tethered, as they are unharnessed, are stretched between the sledges which do not enclose the tents. And thus the camp is formed. It is a work which is now executed rather quickly, in spite of the quarrelling among the dogs, which take advantage of the moment when they are collected together to satisfy their animosities, alternately snarling at each other

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and disputing as to where they shall lie down most comfortably, to the disadvantage of their companions.

While the men are taking the dogs out of the harness, which always remains fixed to the traces attached to the sledges, and are tethering them to the steel wire ropes, Savoie takes the victim which I select to some distance from the camp, and fells it with a blow which never misses from an ice-axe. He then opens it, skins it quickly, and cuts it up into ten shares, which he distributes to those dogs already destined to undergo the same fate ; they are the weakest and those which show less endurance.

Meanwhile Querini, Cavalli, and I make the soup for our detachments ; it takes nearly an hour to prepare. Italian paste, Liebig's Extract, meat and butter make a really excellent soup. As soon as the men have done serving out the pemmican to the dogs they clean their *finiskos*, so as not to bring too much snow into the tent, and sit down upon the sleeping-bag, which is still rolled up and forms a comfortable divan. The pot is taken off the fire and replaced by a smaller one, in which tea is made ; our mess-tins are put in a row, and the delicious soup poured into them. In my detachment, Petigax, who is the oldest, always makes the distribution, with the most scrupulous justice and to our entire satisfaction.

And now comes the moment when all our hardships and troubles are forgotten, and when our gloomy forebodings subside. I might venture to say it is a moment of enjoyment ; the mess-tin warms our legs, on which it rests, and our benumbed hands which hold it ; the heat which radiates from it melts the ice clinging to the edge of our woollen helmets and irritating the skin of our faces, and every spoonful we swallow diffuses a feeling of comfort through the whole body. We eat slowly, so as to prolong this moment of pleasure.

Meanwhile the water for the tea is boiling ; sufficient is made to

give each of us a large glassful, which we drink while it is almost boiling. The saucepans are then filled with snow for our breakfast next morning, the tins put away, and the sleeping-bag is spread out, filling nearly all the bottom of the tent. We hang up our *anorakers* outside it, and our *finstros* inside near the entrance, to keep them tolerably dry; then putting on our Jaeger jackets, we set about getting into the bag of down, having first helped each other to stretch it out. This work is very fatiguing, and we are often bathed in perspiration when it is over. At last, we lie down beside each other in the large bag of reindeer-skin, which we close over our heads, and its frozen fur seems sticky when it touches the skin of the face. The cold seizes us again, but the thought that we are about to fall asleep consoles us.

This evening it was very late when we entered the sleeping-bag. We wished to save Basket's leg, as we should be sorry to kill the dog, so after dinner we torment the poor brute for a long time, with tepid water and violent friction, but without any result. Just then the doctor comes to tell me that one of Ollier's heels has been frost-bitten; while on the march his leg sank into the water, but as it seemed to him that his foot was still warm he did not wish to stop to change his shoe. The men relieve each other, under the tent of the first detachment, for a considerable time to rub poor Ollier's frozen foot; about half-past eight the blood has begun to circulate again in the entire heel, and we lie down to sleep.

It has been a day of unpleasant incidents; one of the mess-tins has given way; one of the men has therefore been obliged to take his soup from the tin used for measuring out the petroleum, luckily still new, and will be compelled to do so henceforth.

Saturday, March 17th.—The cold was again intense last night. At five yesterday evening we had -45° . This morning at eight there

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were -46 . I regret still more the accident to my minimum thermometer.

When the provisions were served out yesterday one of the sledges, which is still in a good state of preservation, was left completely unloaded. Querini asks me to be allowed to take it, instead of one of his which has been very much injured, and must consequently be abandoned. Much time is lost in shifting the load, and also in the ordinary work of packing up the camp, as the cold renders even the smallest operation slow and complicated. It is past eleven when the convoy at last sets off. We have made an excellent day's march, walking briskly, almost always towards the north, until half-past five, and have gained not less than ten miles in latitude. We had not many pressure-ridges to cross, yet the bows of two more sledges broke.

At six in the evening the temperature is -44° . Is this temperature never going to rise?

Sunday, March 18th.—At 6 a.m. the thermometer marks -44° ; the south-westerly wind of yesterday, which gave great hope of a milder temperature, has shifted round to the north-east, and blows rather stiffly; later, about eight o'clock, it changes suddenly to the south-east.

We set off at ten, marching well enough for about two hours. Then we encounter one pressure-ridge after another; it is downright maddening. The wind is now very fresh; it benumbs us, and raises a little snowdrift, which stings the face; shortly after three it comes by gusts, which gradually seem to grow stronger. I order the camp to be pitched quickly and we have hardly time to unharness the dogs and to take shelter under the tent before a violent storm is upon us. The temperature has risen to -33 , but it is impossible to remain exposed to it.

To-day we have again perceived the tracks of a bear trending

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towards the north, but slightly effaced. We have travelled from five to six miles. Although it is now eight days since we left the hut, we have not as yet succeeded in performing a single satisfactory march, and taking the average of the distance covered every day, it proves to be very much less than that necessary to obtain some result from our expedition. The want of light at first, and then the intense cold, have prevented us from marching more than eight hours, and sometimes from



"IT IS DOWNRIGHT MADDENING"

doing even as much. I see that in these marches, and in pitching our camp, my men do as much as they can in the fullest measure, and with admirable tenacity, and I am convinced that under these conditions it would be imprudent to demand greater efforts from them. And now the wind, which is blowing with violence and whirling round us, will raise fresh obstacles to our progress. Yet at all costs it must be more rapid!

What can be done? I ask myself that question a hundred

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times a day, while on the march and at night in the sleeping-bag, while shivering in my frozen clothes, which the warmth of my body must soften, and while preparing our humble meals—at every moment, in fact, when my mind is free from other cares. Within eight days I am to send back four men; eight sledges and six men, two of whom will always be employed in front opening a way through those troublesome ridges, will remain with me. If so far I have made such little progress with ten men and eleven sledges, what shall I be able to do now if the state of the ice be not absolutely changed?

Monday, March 19th.—The wind blew with violence all night, and every moment it seemed as though our tents would be carried away. The weight of the persons inside and the snow heaped up outside, however, enabled them to resist the gale. At six o'clock the wind was blowing harder than ever, and I waited until nearly a quarter-past seven, at which hour it seemed as though about to subside, before calling the men.

When about to start it was found that the trace of one of the sledges of the second detachment was broken, and as it was absolutely necessary to mend it, we were not able to set out before eleven o'clock.

At first, it seemed as though the ice would be as difficult to cross as it was yesterday, but, on the contrary, it presented a series of level stretches, over which we quickly made our way. This continual succession of surprises, sometimes agreeable, sometimes the reverse, which the state of the ice affords is curious. The range of our sight is very limited, even if we climb up on a block of ice, and besides, even at a short distance it is easy to be deceived; sometimes we think we see tremendous pressure-ridges, but on drawing nearer we find easy, natural passages, and then a succession of level

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expanses. At other times, it appears as if all were smooth before us, yet after going a short distance we find ourselves confronted by difficult passes over very rugged ice, which force us to stop and work for hours with very small result. Hence, when travelling over good ice we are tormented with the dread of what we may light upon at any moment, and when engaged in striving with the pressure-ridges vexed by the thought of the long delay involved. Our minds are consequently in a continual state of indecision and discontent, which requires a good deal of philosophy to overcome.

To-day, in spite of the fresh easterly breeze, accompanied by drifting snow, and although we started late, we get nearer to the north by about nine miles. The temperature, which has remained at -27° , allows us to work very well. We are encamped on the border of a level expanse of this year's ice, behind a pressure-ridge, where we have vainly sought some shelter from the wind, which comes in violent gusts, shaking the tents and enveloping everything in snow. But the pot, which does not take long to boil, makes us forget every worry.

Tuesday, March 20th.—The sky is cloudy, and there is still a fresh breeze from the east, which brings drifting snow. The temperature is -29 .

Towards nine o'clock, half an hour before our departure, I send off Petigax and Fenoillet with a sledge, to which the best dogs are harnessed. I have great confidence in the cleverness and prudence of these two men. They will prepare the way, independently of the convoy, without being interrupted by those stoppages which it is so often necessary to make in order to remedy the slight accidents which frequently happen to one of our many sledges or to their gear, and they can give up all their strength and time to opening a path through the ridges and examining the

ice. The rest of the convoy will thus no longer have to wait until the way is ready, and this will prevent the dogs from entangling their traces, another cause of delay in starting after every short halt.

At half-past nine I leave with the ten remaining sledges, and follow the track of the first ; Savoie helps me to guide the three of the first detachment.

In the forenoon, we cross several level stretches, but after mid-day the surface of the ice is bad, chiefly on account of the deep soft snow, which yields under the sledges and in which we sink up to the knee. The dogs are very much harassed, and as the poor brutes are quite worn out, about half-past four we encamp.

A dog of the second detachment escaped two days ago, and refuses to be caught. It follows or precedes the convoy at a respectful distance, and when the other dogs get a glimpse of it they bark furiously and try to pursue it, thus throwing the train into disorder. If the fugitive cannot be captured this evening I shall shoot it in order to prevent this.

To-day, in spite of the bad condition of the snow, we have travelled about eleven miles, and are very well pleased. I calculate the distance we have covered by reckoning the hours of march and the stoppages, and measuring with the chronograph the number of steps made in five minutes every time the nature of the surface changes. I have also requested the guides, who are well accustomed to calculate the distances travelled over ice or snow, to form an estimate of our marches. While at dinner in the evening I draw up the average of the various estimates, which, with some slight exceptions, generally agree with my calculations.

I have no other means of calculating the distance we have covered, for at the very outset the four pedometers with which we

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were provided were lost or spoiled, and an odometer¹ which was set to work behind a sledge was at once broken by the roughness of the ice. We have, indeed, another pedometer, but I wish to preserve this for the smooth ice which I am always hoping in my heart we shall find more towards the north.

This evening we have again -29° and still a fresh breeze from the east; it has been blowing continually for three days and the barometer is still falling.

Wednesday, March 21st.—I have thought of sending back only three men in the first detachment, and of adding one to mine. Thus, if we should meet with the smooth ice on which our hopes of success are founded, we shall be able to make up more easily for lost time.

Another consideration leads me to take this resolution. When the third detachment shall have to proceed alone and to prepare its way, as it did very successfully yesterday, by means of two men as advance guard, only one man would remain in the rear. This would be too imprudent, as we would therefore be obliged to advance all together with less speed. With four men, on the contrary, two can go forward with a sledge and the others follow at a certain distance with the remainder.

To support a fourth man until May, I would require about sixty rations. By making the first and second detachments return two days and four days earlier respectively, I would gain thirty-six rations as well as the ten rations for the return of the man I would keep with me, and by economising the provisions of my own detachment, which I consider easy to accomplish, my plan becomes feasible.

¹ The odometer is described in *Scientific Observations taken during the Polar Expedition of H.R.H., the Duke of the Abruzzi*, Part I., report of Commander Cagni.

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The day is cloudy, the wind is more feeble and has shifted to the north-east. We set out at nine, and at the beginning of our march we encounter great difficulties at some broad pressure-ridges, where we soon overtake our advance guard. I set Ollier and Savoie to work, and thus after an hour we were at last extricated from this troublesome pass. But other obstacles made us advance slowly, and it was only after noon that we could make any progress, travelling altogether about nine miles towards north-north-east, rather than north, as the ice in that direction seemed so very much broken up that we were dissuaded from crossing it.

The temperature has fallen again; this morning it was -30° , this evening -38° ; the men are very much tired, but the dogs are not, which is contrary to what usually occurs.

At sunset, from the top of a block of ice, we distinctly see to the south the outline of Prince Rudolph Island, which seems very small. But we ought to be at least seventy miles away from it—too far, indeed, to allow our island to be seen from the slight elevation from which we sighted it. Are we nearer to it? Or do we see by the effect of refraction the land which is below our horizon? The air is very clear, and I prefer to adopt the latter supposition to the former, which would be too discomforting.

I called Querini and Cavalli under my tent and announced to them my intention of sending back the first detachment sooner. This I formed of three persons: Querini, Ollier, and Stökken. I clearly explain the reasons which guide me in the formation of this first detachment, which shall leave on the morning of the day after to-morrow. Querini returns because he has less endurance, and on the whole is not so useful to the expedition as the doctor; Ollier, because he has already suffered twice from frost-bite and

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shows a special predisposition to that ailment; and Stökken because he is not Italian.

Thursday, March 22nd.—The temperature is -35° . We set out early and cover a good distance in the forenoon; but after mid-day we meet with a succession of disheartening difficulties.

About half-past two we are in front of a vast belt of *séracs*, very hard to cross, which stretch to the east and to the west as far as the eye can see. As this evening we must unpack some sledges, in order to get ready what is to go back, I stop the convoy, and after sending the guides forward to open up a way for the following day, we pitch the camp with the help of Stökken and the sailors. We then collect the rations for the detachment about to return, which throws all our provisions into confusion, as the rations which had been prepared for the return of the first detachment had been placed, four by four, in bags which must now be handed over to the second.

I give Querini :—

A small box containing Italian paste, vegetables, and		
biscuits	30	rations.
A small box of groceries	30	„
Ten boxes of meat	30	„
A pot of Liebig's Extract	45	„
Three tins of condensed milk	30	„
Three tins of butter	30	„
19 lb. 5 oz. 7 dr. of pemmican	30	„
11 lb. 14 oz. 6 dr. of petroleum	35	„
44 lb. 1 oz. 7 dr. of pemmican for the dogs	70	„
33 lb. 1 oz. 1 dr. of the men's pemmican to be given to the dogs		

He will also take all his camp equipment, arms, instruments, drugs, and the same amount of clothing as the other two detachments. But, as had been settled before leaving the hut, Querini, Ollier, and

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Stökken are each to take from his reserve of clothing and hand over to me a pair of *fnskos* and a pair of woollen stockings, to be given to the men who are to form the third detachment.

Having finished our preparations and again tied up the sledges the loads of which we had had to derange, I write a letter to His Royal Highness, which Querini places in his pocket-book. Querini is naturally disappointed at having to return, but perfectly understands the sentiment of duty which has inspired my resolution. I give him a roll of photographs, taken at some of the most difficult and striking moments of the last days, and we go to get our men's dinner ready.

It is again very cold. The thermometer marks -40° .

Friday, March 23rd.—This morning we took four hours to get ready. I made Querini select six of the best dogs belonging to the first detachment, four of the weakest, and a sledge which should not belong to the third detachment. He chose one belonging to the second detachment, on which there was a *kayak*; the boat was taken from it, and it was given a load amounting to 485 lb. As he has ten dogs, and as the track is marked for a good part of the way, we hope he will reach the hut in a few days and deliver news from us.

Before the tents are struck, Querini comes into mine to take leave of me. He expresses his wishes for my success and we embrace with emotion. I ask him not to leave until my convoy has gone, lest at the last moment some dog might escape and follow his sledge. Ollier, in bidding me good-bye, with his pleasant smile, begs my pardon frankly for the trouble caused by his frost-bite! I ask him if he returns willingly. He answers that he does, because he sees that his companions have more endurance than himself.

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Soon afterwards, I lead my sledges on the tracks of Petigax and Fenoillet, who left half an hour previously. We enter the broad pressure-ridge which stopped us yesterday ; it is as though we were walking along a mule-path, which must have caused the four guides much labour. After crossing the most difficult part, I stop to look towards the south, and see Querini's little convoy on the march. We are already far away, but we can still see them distinctly, and we greet each other with a last wave of our caps.

Poor comrades ! At that moment, certainly, our souls could hardly repress a feeling of envy for those who, we thought, were returning to comfort, to life, and to their country.

* * * * *

We proceed on our way, Savoie and I in front with the three sledges of the third detachment ; the doctor and the two men following with the other five. These, with one exception, carry little more than half a load, but they are more or less broken, and drawn by the worst dogs. I preferred to take with me ten sledges rather than eight, because I am convinced it is much easier for a man to guide two or even three sledges lightly laden, than a single one fully loaded, especially since only four of them are left in good condition.

It was a very fatiguing day ; we had continually to carry the sledges over ridges. We crossed a belt more than two and a half miles wide, raised twelve or fifteen feet above the average level of the ice-pack, and composed of blocks, pinnacles, and hollows. The snow, too, in which we often sank up to the waist, was another obstacle which wore out our strength. On the whole, we have probably gone seven or eight miles towards the north, but at the cost of how much suffering ! The fatigue, after all, is not so bad ; what is worse is the state of the sledges, which is becoming more

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and more deplorable on account of the frequent difficult and winding crossings in which it is almost impossible to avoid jolting. At every jolt, a piece of an under-runner falls off, a piece of white metal breaks, or else one of the bows or a trace gives way.

We pitch our camp towards six ; it is still cold and there are pressure-ridges yet before us. When shall we see those level plains which enabled Nansen to accomplish eighteen miles a day ?

While thinking over the extraordinary latitude obtained as the result of an observation taken two days ago, it flashed suddenly upon my mind that the ice-pack, leaning against the island, may have turned on itself and been carried back towards the south in a few days. If this were so, it would indeed be a supreme misfortune, the ruin of the expedition. How is it that in the course of two years that did not happen to the *Fram*, nor to Nansen in his expedition ? In that case we must have deviated to the west very much from our course, since neither the current nor the prevailing winds would have allowed the ice-pack to move towards the east. The island which we sighted the day before yesterday was not, then, Prince Rudolph Island !

I rose at two o'clock at night. Venus was shining ; I might have taken an observation, but my hands were so benumbed that it would not have been possible to hold the sextant, and I had not the courage to try.

Saturday, March 24th.—Before setting off we had to adjust some of the loads, to bind copper wire round one of the under-runners of a sledge which had lost its iron runners, and make several other indispensable repairs. We were not ready until eleven.

We find the way very fatiguing, but nevertheless make more or less progress towards the north. At half-past twelve, seeing that the doctor is not following me, I leave Savoie with

four sledges and go back. The second detachment had stopped to take off a broken under-runner. We lost about twenty minutes, and then met a succession of level spaces which may have amounted altogether to eight or nine miles ; we cross them, without stopping, in less than two hours, and then come again upon a difficult way.

The wind shifts from east-north-east to north, and brings



"ON ACCOUNT OF THE FREQUENT DIFFICULT AND WINDING CROSSINGS"

drifting snow. Although we have marched a little under seven hours, we are very weary—tired by the snow, which was very bad the whole way (except on the flat places where the wind had swept it away), and our legs feel as though they were frozen from continually sinking in it up to the knee. We encamp about six o'clock under the shelter of a great block of ice, which protects us from the north wind.

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The state of the sledges is becoming more and more deplorable. I am resolved to lighten some of them to-morrow and mend them as thoroughly as possible ; if this were to continue, in three days we should not have a single sledge left.

This evening the thermometer marks -37° and there is a fresh breeze from the north ; at any rate, we have to-day covered more than ten miles, which consoles us very much, in spite of the hardships caused by the temperature.

The troublesome dog which deserted for a couple of days at the beginning of the week, ran away again to-day, but was caught this evening : it is a fine animal, strong and robust, and it would be a pity to kill it. The doctor undertakes to tame it ; in the meantime he secures it with two chains, and moreover passes the steel wire rope through its collar. After dinner he finds that it is again trying to escape, and begins its education by beating it mercilessly with the remains of an under-runner. Fully convinced that he has given the animal a wholesome lesson that it would never forget, our doctor returns to his tent and enters the sleeping-bag.

During the night the dog breaks the two chains, gnaws the steel wire rope, a trace, and the end of the runner of a sledge near to which he was tied, and by working with its teeth, in an incredible way, it frees itself, after doing an amount of damage which it costs us nearly an hour to repair. As if that were not enough, and as though to be revenged on its tamer, it makes a hole in the tent of the second detachment and steals the butter which was to serve for breakfast next morning. When we awoke there was much laughter behind Cavalli's back, who, with his men, was forced to make a meagre repast. On the following evening, the unfortunate animal expiated its misdeeds with its life.

Sunday, March 25th.—Temperature -39° , and north wind.

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In the forenoon we put all the sledges in order, binding the under-runners with steel wire, which the doctor and I get ready by degrees, undoing two of the ropes for tethering the dogs—a most unpleasant task which must be performed without gloves, and in the course of which I get a blister at the end of the forefinger of my right hand, which has already been twice frost-bitten.

The present temperature and the north wind are a permanent danger to my hands, which are still suffering, and what is worse than the ceaseless pain, is the constant fear of a more serious frost-bite which might prevent me from continuing my onward march.

At noon it is so cold, and the doctor and I have our hands so benumbed, that we do not attempt to take the height of the sun, since we cannot hold the sextant straight.

When we awoke in the morning we took half of our first meal. We take the remainder after noon, and then Petigax and Fenoillet set off with a sledge. We were to have followed them a quarter of an hour later, but we delayed because at the last moment we perceived that a tin of petroleum was leaking through a hole so minute that we could not plug it. We made use of a new species of solder—some snow and saliva, which held very well.

At three o'clock we are on our way, and after a very fatiguing march of over half an hour we overtake Petigax, who has been stopped by a very long channel running from east to west, which he has vainly tried to cross. To the west there stretches a complete network of channels, which it would be folly to enter, and the ice is cracked in every direction all round.

We retrace our steps with all the sledges, which I stop on a level spot, where the cracks are not dangerous; I send the three

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guides in different directions to explore, and the doctor and I clamber up on a mass of ice high enough to enable us to watch them with a binocular.

They come back, after searching for a couple of hours, with discouraging intelligence; the channel which runs from east-south-east to west and which has stopped us, meets another to the east of us which runs from north to south as far as the eye can see, and grows wider towards the south. If we tried to turn the network of channels seen to the west, we should trend almost towards the south-west, and march very far in that direction. As rather fresh winds have blown latterly from the north-east and the east, it is not prudent to go more to the west. On the other hand it is almost seven o'clock, and I think it is more advisable to encamp under the shelter of a large hummock which is about 500 yards from the place where we encamped last night. What a march! It is at least lucky that our sledges are in good order; but how long will they last?

These channels must have been partly opened by the many changes of wind and partly, perhaps, by the high tide of the 21st. The temperature, which this evening is -39° , and the steady breeze from the north, will soon freeze them, and we may very probably be able to cross them to-morrow.

There is now a large blister at the end of my forefinger, and my left hand also pains me; but nothing can be done, and we must go forward all the same.

Oh, how we long for a quick return of winds from the south! We are now hardly alive. The reindeer-skin sleeping-bag is full of snow deposited by our frozen breath. We lie down in ice, and awake in a cold bath, very lucky if our teeth have not been chattering all night. And soon after we get up our clothes, our

woollen helmets and our gloves are again a mass of ice, and the wind, into the bargain, cuts our faces.

Monday, March 26th.—Temperature -34° . At half-past nine we are ready to set out when Petigax, who was sent forward to ascertain if the channel to the north of us is frozen, comes back to tell me that it cannot be crossed as yet. He and Fenoillet saw a walrus, which rose up vertically through the thin ice, as these animals frequently do ; it then roared and disappeared and came back no more.

I set out with Petigax, and we go towards the east to the edge of the large channel which yesterday formed a regular lake. It is now not wider than 150 or 200 yards and trends towards the north-west, but the ice is very thin. This is, however, the only way by which we can attempt to go on to the north, and I resolve to run the risk of crossing.

I come back to the camp to take the sledges, and by making them cross one at a time with very great care, I succeed in bringing the whole convoy to the northern side of the channel, where I find that the ice is stronger. Shortly after, a sledge falls in ; we pull it out without much labour, but this shows us that it is advisable to return to the ice-pack, which is execrable.

We luckily meet with another channel, running due north and well frozen ; it is a regular high road over which the sledges run, with but slight interruptions, for about two hours, during which we can hardly keep up with the dogs.

At half-past two we have again to contend with pressure-ridges ; they are not, however, freshly formed like those we crossed to the south of the great channel, where last night the ice-pack must have been again thrown into disorder. Petigax in his expedition with Fenoillet this morning has assisted at the last

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movements of the ice. After an hour's work, which was exhausting for us and destructive to the sledges, we find another small frozen channel, on which we advance safely and swiftly towards the north, and beyond it several fine level stretches covered with very hard snow. We encamp at half-past six, after having covered not less than twelve miles towards the north; who could have foretold it this morning?

The cold is still intense. This evening it is -37° , with a breeze from the north, and we are craving for a little warmth, as the Jews craved for manna in the desert.

Tuesday, March 27th.—Last night at half-past two the thermometer marked -41° and this morning at eight -38° , and still the north wind! We had to unload and put right a sledge in which a leather strap had given way, and left at eleven, obliged to march towards the west, as from the north-west to the east the way was closed by a broad pressure-ridge which our sledges could not cross; we are luckily able to get beyond it before mid-day, and once more we go in the direction of the north.

We find a succession of level stretches separated, however, by barriers exceedingly difficult to surmount. These levels are, moreover, undulating, and force us to ascend and descend continually, so that our strength is worn out by helping the sledges. We fortunately afterwards meet with smooth ice and very few ridges; but the snow has become very soft; we often sink into it up to the middle of the leg and always over the instep.

The wind has at last subsided and we immediately feel relieved; the sun begins to warm us and we almost perspire. Towards half-past five, the dogs, which for some time we had to drive on, are quite worn out with fatigue, and the men, too, are very, very weary. I give orders to encamp. We have progressed thirteen

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or fourteen miles towards the north. At seven the temperature is -39° .

Wednesday, March 28th.—At one o'clock after midnight -45° , at eight -40° . Although I called the men at six, we do not set off till ten. With this cold it is impossible to start more quickly. At every knot, at every lashing, an effort must be made to prevent our hands from being frozen.

At first we make good progress. Then comes a stoppage of an hour's length on meeting with a very broad ridge. In the meantime I am able to take an observation, which gives me the disheartening latitude of 83° .¹ Have the artificial horizons become crooked? The level does not show it, and yet it seems to me impossible that we should have fallen so low towards the south.

I have hardly any doubt with regard to the estimate of the distance we have travelled, as I have calculated it very carefully, and always, intentionally, at a little less than it really was. According to my reckoning, we ought to be about $83^{\circ} 50'$. Fifty miles difference in two weeks!

Immediately after mid-day we have a difficult march for half an hour, and then a splendid succession of levels covered with moderately hard snow, over which we advance quickly until six o'clock, stopping only now and then to let the dogs take breath. Have we reached at last the smooth, even ice-pack we were hoping for so much?

Later, when we wish to encamp, the ice shows so many cracks that I think it prudent not to stop there, and we go on farther towards the north. We cross without difficulty several small channels recently frozen over, some perhaps less than twenty-four

¹ Proved afterwards to have been $82^{\circ} 58' 15''$.

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hours since, but the ice which covers them is already very strong. It is only towards a quarter to eight that we find a level place which does not show signs of too much danger from pressure, and there we pitch our tents.

While the sun is setting the thermometer marks -43° , an hour after it is -47° , and a north-west breeze has risen. We feel the cold very much, and at half-past ten are not yet in our sleeping-bag. By this temperature we certainly cannot, without a very great effort, do more than seven hours' effective marching, which involves nearly fourteen hours' labour for the men. To-day, with the exception of merely half an hour for their meal, they have been sixteen hours on foot, and though, on the whole, we have met with very good ice, practically we have not travelled for more than eight hours and a half.

I calculated that we are about eighteen miles farther to the north, but we could not repeat for two or three days in succession the effort we made to-day with impunity. If to-morrow I meet with moderately good ice, I shall dismiss the second detachment earlier, so as to save a few days' provisions; and even if the latitude were exactly what I found by my observation, I will not lose all hope yet.

Thursday, March 29th.—We pass a very bad night, more frozen than usual in our sleeping-bags, and at four o'clock in the morning I had not been able to fall asleep on account of the cold. I heard a constant creaking, and went out of the tent to see if it was caused by pressure; it was, I found, the stiff north-westerly wind which made the surface of the snow crackle. The thermometer marked -49° . I awoke when it was long past nine; all the men were still fast asleep. Petigax told me that, in spite of his fatigue, even he was not able to fall asleep till very late on account

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of the cold. Thus, out of the ten hours passed in the sleeping-bag, we are at most able to sleep six.

We should have repaired the damage to the sledges, but so as not to lose any time we have tied them up as well as we can. But this detains us so that we do not set out till after mid-day. The sky is clouded; the temperature has risen to -32° , but the stiff north-west wind which continues to blow does not let us feel



"THE SNOW, WHICH HAS BEEN BEATEN DOWN BY THE WIND, IS NOW VERY MUCH BETTER"

any relief. We make rather good progress, and meet with no serious obstacles. The snow is, however, very bad, and the drifting snow renders the light so uncertain that Petigax can hardly choose his way.

At six o'clock we are stopped by a very extensive and intricate belt of pressure-ridges. We have only travelled about six or seven miles; it is not much, but I do not wish to prolong the march till as late as yesterday; it would require at least an hour's work to open a way. Therefore, while Petigax and Fenoillet are exploring, we encamp.

The level spaces which we met yesterday and to-day make me

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hope still more that we shall advance more easily when more to the north ; and I think that it will be advisable to send back the second detachment on the day after to-morrow and go on, we four, with six sledges.

Friday, March 30th.—At ten o'clock the three guides are already far ahead of us, preparing a way through the mass of ridges which stopped us yesterday evening. At a quarter to eleven we have passed them with the whole convoy, and are upon a plain the end of which we cannot see. We travel over it with ease, for the snow, which has been beaten down by the wind, is very much better than the day before yesterday.

At mid-day I am able to take an observation, which gives me 84° 10' latitude. The ice-pack must have drifted towards the south at the rate of three or four miles a day, and the wind still blows from the north. Shall we be compensated for it by the southerly winds? In spite of this very modest latitude, I do not despair ; in twenty days' travelling, over ice such as we have since the day before yesterday, we may cover 200 miles. And when thinking of it, the future seems to smile on me, and I lengthen my stride instinctively.

The weather is very fine, and the sun warms our backs, but our faces are still benumbed by the north wind. This evening we shall share our provisions with the second detachment ; it will be a rather long business, on account of the changes introduced into the method of keeping our accounts, and therefore we encamp early, about three o'clock.

I give the doctor fifty-four entire rations, and there remain 216 for me, which, strictly speaking, will enable me to advance for eighteen days more—that is to say, until April 17th. I bid him choose sixteen of the best dogs of the second detachment, and I

give him besides eight of the weakest, which, with 220 lb. of pemmican, will amply serve to feed his dogs during the eighteen days which at most he will take to go back.

It is certain that the return journey will be more difficult for the second detachment than for the first, because, in an expedition, especially over ice, the difficulties do not increase in a direct ratio to the number of days employed in travelling, but in double ratio, or even more. Besides, as I have not yet been able to calculate the longitude, I do not know to what extent we have drifted since we last saw the island.

On comparing the doctor's chronometer with my three, I find that it goes very well; that is an advantage, and when more to the south Cavalli can, in any case, take a good observation, since during the winter he learned how to take an observation and make the calculations very well.

We have still ten sledges, six of which are in a bad condition, and the others very much dislocated; four of the former belong to the third detachment and two to the second. I select two of the others for my detachment, and the doctor chooses one. That which remains is absolutely useless; it is taken to pieces, and its remains shared between us to help to mend and strengthen the other sledges.

The doctor also thinks it advisable to abandon one of his *kayaks*. They are all in a very bad state, and require to be carefully examined in order to ascertain which is most damaged and most difficult to mend; we also share a part of the remains of this fragile boat, which we take to pieces, between us.

These changes have forced us to undo all the loads, and make many variations in the way they were distributed among the sledges. After dinner, at half-past eight, the thermometer marked

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-45, and we went back to our work, which lasted until eleven. We exchanged the tent and the sleeping-bag of the second detachment for those of the third, because henceforth the latter will be composed of four men, and the former of three; Cardenti and Savoie are to go back with the doctor.

Before repacking the loads, we mended our poor vehicles as best we could. All the evening we chatted more than usual about the hut, and the abundance of everything there! About the comrades we had left there and the *Polar Star*. The men, whom the same toil and the same dangers held together by the strongest bonds, who were on the point of bidding each other farewell, and possibly would never see each other again, did not show the smallest signs of uneasiness with regard to the future. And I admired their gaiety, which in that spot, so far from every source of life, on the eve of a separation in this immense frozen, lifeless desert, appeared to me as a sublime manifestation of strength.

Saturday, March 31st.—We all slept very badly, partly by reason of the intense cold, and partly on account of having changed our sleeping-bag.

While the dogs are being harnessed, I show my forefinger to Dr. Cavalli; it is the first time that I unbandage it since the blister was formed. As the sole remedy, he promises to amputate it for me on my return. I write on his notebook a letter to His Royal Highness, to inform him in general of my plans, which I explain minutely to the doctor, and I request them both not to be uneasy if they do not see me return before the beginning of June, as I shall endeavour to economise my provisions in every way so as to hold out even beyond the first week of the month. I lay special stress on the advice I give him, as I gave Querini, to trend as much as possible towards the south-east until he has sighted

the island, and I put him, too, on his guard against the dangerous temptation of changing the route unless absolutely certain that it is necessary.

At ten o'clock Petigax and Fenoillet bid farewell to their companions, and set off towards the north with a sledge; shortly after I bid Cardenti and Savoie good-bye; then, clasping Cavalli's hand, a sudden feeling of emotion makes us fall into each other's arms. I whisper to him a last adieu to carry to my mother and to my betrothed, and hasten away to my sledges, which, with a hoarse and broken voice, I set on the track of Petigax.

The weather is very fine, the sun shines and floods the snow with light, and our five sledges advance swiftly in a slightly sinuous line. I lead the foremost, Canepa is in the rear. While crossing a small pressure-ridge, we turn to send a last greeting to our comrades. The doctor waves our flag, his men wave their caps, and they all shout "Good-bye, we wish you a happy voyage!" . . . We would wish to answer, but our voice fails. . . . Good-bye, dear comrades, may God protect and guide you safely!

CHAPTER III

Bad Weather and Rapid Marches. Our Last
Effort. $86^{\circ} 34'$ N. lat.

CHAPTER III

BAD WEATHER AND RAPID MARCHES. OUR LAST EFFORT.

86° 34' N. LAT.

WE are alone on the immense plain, the northern boundary of which meets the sky. Before us are two straight furrows which draw nearer and nearer to each other in the distance; these are the tracks of our first sledge. Behind us, the departure of our friends has severed the last link which united us to the world, and it seems to me only a few minutes since I have been definitely cut off from my country. Along those two furrows, which seem to have no end, our thoughts run, filled with fresh hopes and desirous of glory, and the boundless desert seems to call upon us to perform our task, and to fulfil our duty. It does not inspire us with a feeling of terror, but seems to say, "Now, all depends upon you; unite your forces, give them fresh vigour, and go forward to reap the fruit of the sacrifices made by all your companions!"

The sledges glide along easily, and the dogs go so quickly that we have to lengthen our steps. We have taken off the *anorakers*, and it is the first time that we really perspire since leaving Teplitz Bay.

We have kept forty-nine dogs, nine of which were harnessed to the sledge which goes first to open a way for us, since this sledge has more work to do than the other five, which follow its track,

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and to which we have harnessed eight dogs. The load is divided nearly equally among them all; it varies, however, from 485 lb. on the sledges which are in a better condition, to 440 lb. on those which are most damaged. The best dogs are harnessed to the former, and the weakest to the sledges which carry less weight.

To-day (March 31st) we perform one of our best marches, from seventeen to eighteen miles in seven hours and a half, over a succession of such large expanses of level ice as we have never seen before, separated by very long pressure-ridges which the sledges easily cross over without help.

Towards four o'clock a south-easterly wind rises, accompanied by drifting snow, and though we continue to march along smartly, at once we feel a sensation of chill. When Petigax and Fenoillet saw the weather become threatening, they slackened their pace and we overtake them. The wind freshens at half-past five. We did not sleep at all last night, and I know by experience that one hour of strain now will make us lose several to-morrow. I seek, therefore, a shelter from the wind behind three great blocks of ice, and have the camp pitched there.

At seven o'clock the temperature fell to -39° , and we recall to mind with pleasure the few hours of delicious warmth which we enjoyed during the march.

Sunday, April 1st.—Last night there was a furious wind. Luckily the tent had been mended and we slept very well without feeling the cold. This morning, to our great surprise, we saw the thermometer at -25° . When about to harness the dogs, we have to put off doing so, as the wind is too strong and the snow-drift does not allow us to see thirty steps before us. We wait until noon, and profit by our rest to mend the dogs' gear and the traces.

Prayers were said, followed by the cry of "Long live the King!" which now, more than ever, brings us the thought of our country and affectionate memories of all we love. Later we enter the sleeping-bag to rest our backs, which are tired through remaining bent so many hours; under this tent, which, as it has been widened, is still lower than the one we had, we cannot keep our bodies straight, even when sitting on the bag rolled up.



OUR CAMP.

It is delightful to be in the bag when it is not frozen, and snores in every key are soon heard.

At half-past four the force of the wind subsides a little. I go out of the tent; it is impossible to see beyond a few steps, as besides the snowdrift, which is still being raised by the wind, there is a fall of fine but thick snow. The dogs are completely buried; nothing is seen of them but the ends of their muzzles, which stand out from the whiteness of the snow; they must feel very pleased

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by this unexpected rest, judging by the unusual silence in which they pass the whole day.

I wait another hour, and as I see that the weather does not change, resolve not to move this evening, and get ready a dinner with a little more than two rations. No work has been done, and there ought to be no necessity for eating as much as usual. In reality one would say the contrary, but our wishes cannot increase the quantity of the soup, and we think that we shall eat with more appetite to-morrow. I give the dogs also only a half-ration of pemmican.

Meanwhile, with these — 25 we remain under the tent without any suffering, and to me, who am writing with half my person in the sleeping-bag, it seems that I am a great sybarite. I have made a careful calculation of what pemmican remains to us and for how many days it may last. It is a rather complicated calculation, as the distribution of provisions must be so regulated as to diminish every day the weight drawn by the dogs, and on the other hand, their number must be gradually reduced to what only may be absolutely necessary to draw the sledges easily. The number of dogs to be considered as necessary naturally varies within certain limits, according to the state of the ice and the length of the marches; and as I cannot know these two conditions beforehand, I must make my calculations with a certain allowance. I see, however, with pleasure, that I have no reason to be uneasy on the subject.

Yesterday evening Canepa began to perform the disagreeable but necessary duties of a butcher. Morettino, a small black dog which I had never believed would have deserved to be spared for so long, went lame, and was therefore killed. Although it was one of the smallest dogs it furnished eleven rations. We had still

forty-eight moderately good dogs, and among them about thirty really big and strong. By the middle of June we may still have twelve well-fed dogs; and more than we may require, for if by that time we have not got back to the island, we would be beginning to die of hunger.

In the evening the temperature rises again up to -17° , but the relief is not felt so much as I would have thought, on



"TO PERFORM THE DISAGREEABLE BUT NECESSARY DUTIES OF A BUTCHER"

account of the wind, which has again begun to blow strongly from south-south-west.

Monday, April 2nd.—We have passed a really good night. The wind fell towards evening, and we were so warm as to perspire in our sleeping-bag, which had been thawed—a pleasure which can only be understood by those who have passed eight or ten nights with their teeth chattering.

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We are all up at five o'clock, but the wind has again begun to blow strongly from the south-east, accompanied with snow and sleet, which prevent us from seeing anything a few yards off. We breakfast in silence. Yesterday we supported this unpleasantness calmly, because we all required some little rest; it was also a holiday, and it seemed that to cease from working would bring us good luck; but to-day, when we feel reinvigorated, and our dogs are rested, it seems to us really a great misfortune to be obliged to remain idly crouching under our tent.

Our impatience weighs upon us, and increases as the hours pass. We look continually at the barometer, which, although very high this morning, is now sinking slowly; the thermometer marks -14° , but we are almost complaining of the cold. We must make up for these days of stoppage, and I think that by reducing our rations a little we might be able to advance towards the north, for a few days beyond April 17th.

Towards mid-day the wind subsides and the air becomes clear. In less than an hour we have harnessed the dogs, raised camp and set out towards the north. But the clear weather lasts a very short time, and we are obliged to advance with our eyes almost continually on the compass. Luckily, with the exception that the snow is soft and deep, the way is good and we make rapid progress.

At four o'clock the wind shifts from south-east to south-west and then to west, and blows strongly. About five we are enveloped in a snowstorm and obliged to stop; we cannot see farther than the length of the sledge. We seek, groping our way, to shelter ourselves behind the nearest hummock, where we pitch our tent with difficulty; the force of the wind immediately fills it with snow. We had travelled eight miles. While eating

we are covered with snow, and we get into our sleeping-bag, which has luckily not had time to freeze. The temperature has fallen to -29° , and the wind tends to change to the north, which makes us hope well for to-morrow.

Tuesday, April 3rd.—The wind was very strong all night. We had strengthened our tent with ropes, but nevertheless the violence of the storm was such that every moment it seemed as though it would carry it away.

At nine o'clock this morning the barometer is high and the thermometer has fallen to -31° . It is impossible to set out, on account of the strength of the snowdrift. At mid-day I make a soup with pemmican and my men take it while in the sleeping-bag. I then get into it too and stay there dozing all day.

The weather does not change. At 7 p.m. we hear the dogs barking furiously, and as in bad weather they are generally very quiet, we rush out of the tent, thinking that there is a bear. Instead, the cause of their excitement is the formation of a channel about fifty yards from the tent. It runs from east to west and opens slowly until it is about ten or twelve feet wide, cutting the way by which we came yesterday evening. It does not portend any danger to us, but even if it had opened close to the tent, I do not know how we could have transported our camp elsewhere in this horrible weather.

I give half a ration of coffee and milk to the men, who have still to stay in the bag, as when it is stretched out there is hardly room for a single person at the bottom of the tent, which is encumbered with the cooking-stove, the *finskos*, and the *anorakers*. The dogs remain fasting, because they have done no work, and it would be so difficult to serve out their meal.

The driven snow penetrates into the interior of the tent through

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the smallest fissure in the entrance, and covers the bag, our persons and everything with a white sheet; we pay no attention to it, and at most we shake ourselves well before stretching ourselves out to go to sleep.

At 9 p.m. the barometer is still high, and the thermometer marks -32° . Later, the wind seems as though about to subside; it blows in gusts at lengthening intervals.

Wednesday, April 4th.—We are still blockaded under our tent. In the early morning the wind freshened again, and though the sun peeps out, the snowdrift is so dense that we cannot hope to start. Some sledges, which were less sheltered, are completely buried under the snow. We have untethered the few dogs which have not as yet succeeded in freeing themselves, lest they should be suffocated.

It is the fourth day of bad weather. What has become of the second detachment? We all think of it, and often speak of it. The doctor, who had only fifty-four rations, must have been prudent enough to diminish them much sooner than we did, and if it has been snowing more to the south as it has snowed here, he must certainly have been unable to find the track on his second day's march. And the thought of our comrades calms the irritation we feel at our forced repose.

To-day I gave out a single meal towards noon, and advised the men to go to sleep so as not to acquire an appetite, but though they do no work, they all possess it strongly. I served out a ration to the dogs, and it was not hard to do so, as at the first call all the poor beasts came up eagerly.

Thursday, April 5th.—A little before midnight the wind began really to subside; we leave the tent one after another to watch for the return of calm weather. At two the air becomes clear. We rise hastily, and while the men begin to dig out the sledges, I get

ready an ample breakfast (coffee and milk with pemmican), of which our stomachs were really in want.

It took us several hours to get all our equipment out of the snow, and the dogs are only harnessed at ten. Petigax and Fenoillet set out with their sledge, and Canepa and I fold and load the tent.

I thought that the dogs would be weak, as they were fasting since yesterday morning ; but, on the contrary, they were never so



WHILE THE MEN BEGIN TO DIG OUT THE SLEDGES

impetuous, so active, and so eager to run ; they strive to overtake Petigax's sledge, which we see in the distance, and in the meanwhile the convoy goes on swiftly, although the surface is very undulating. Contrary to what we feared, the snow is very hard, as it has been beaten down and kneaded by the wind.

About half-past eight I stop for a few minutes behind a newly formed ridge, in order to allow the advance guard to leave me far behind, and to let our dogs calm down a little. I then make

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one sledge pass through the opening made by the two guides, and perceive that at that spot there is a crack which is widening. A slight movement of the ice-fields has made the passage oblique, and the second sledge upsets while going through : it is that which carries the sleeping-bag and the tent ; it is rather heavy, and we lose some time raising it up and pushing it on. In the meantime, the crack has grown about three feet wider. I slip into it, and if Canepa had not caught my hand in time I would have taken a complete bath. The third sledge, which carried a *kayak*, fared still worse. I had tied a rope to the end of its trace, and with it was pulling the dogs and the sledge from the side to which I wished them to cross, while Canepa was pushing from the other. The first four dogs jump the cleft ; the others refuse, hold back with all their might, drag into the water those which have already jumped, and are dragged in by them in their turn. They are all on the point of being drowned under the sledge, which has slipped from Canepa's hands and fallen into the opening, where its front end has luckily caught in the thickness of the ice. I succeed in cutting the trace in which the poor brutes are entangled, and, seizing them one by one, I pull them out, trembling and benumbed. We then try to pull the sledge out of the opening, which continues to widen slowly ; but in spite of all our efforts, we are unable to succeed. I then think of unloading the *kayak* to save its contents ; but while setting about it, the edges of the channel begin to draw nearer and drive back the sledge, which we pull up out of danger at last.

A few minutes after, the edges united together perfectly, and in the place where the channel was there appeared a faint pressure-line, which we easily crossed with the rest of the convoy. Some of the dogs which had had a bath managed to escape, although we had tied them to a block of ice ; we lose more time in catching

them and settling as best we can the harness and the trace which have been cut, and do not resume our march till half-past ten.

When Petigax and Fenoillet failed to see us appear on the horizon they stopped, and Petigax came back to meet us ; but another wide channel, which opened between him and ourselves, prevented him from coming to our assistance. We followed the banks of this



"IT IS THAT WHICH CARRIES THE SLEEPING-BAG AND THE TENT"

channel for some distance, he on one side and we on the other, and it was only at noon that we all met together.

We have not eaten since half-past three this morning, and have been continually at work. We cook some pemmican behind a block of ice, and at one set out again.

A wind has risen from south-south-west, and the sky is overcast. The ice is moving very much, and we see all round us pressure-ridges being formed and sinking again, channels opening and closing—an indescribable turmoil. It is the result of the sudden

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change of wind on this thin ice, which is not compact, and has already been broken up into small floes by the changeable winds of the last few days.

Channels and ridges are being formed in every direction, but in a more marked manner from west-north-west to east-south-east—that is to say, at right angles to the direction of the wind, which has just set in, and which is now blowing very freshly and raising a snowdrift. We receive it on our backs, and, therefore, it does not annoy us much. We march for several hours with the sledges closely pressed against each other, driving the dogs on quickly in the midst of this endless network of channels and pressure-ridges. Luckily we always find means of crossing them without having to use the ice-axes, for it would be truly dangerous to be obliged to stop on such ice while bad weather seems likely to come upon us at any moment.

At a quarter-past six we find some rather firm, flat ice, and there we encamp behind a block tolerably well sheltered from the south-west wind.

This evening we killed Jason, an excellent dog, which, unfortunately, yesterday evening was so ill-treated by its companions that this morning we could not think of harnessing it, and we left it in a dying condition, as we did not wish to waste any time in cutting it up to make use of the flesh. The poor brute, however, dragged itself painfully along, overtaking us when we were stopped by the accident to the sledge, and followed us during all the march. With the vitality which these animals possess, it might, perhaps, have been cured in a few days, but we could not allow ourselves the luxury of having any sick. Canepa had not exercised his functions as butcher for the last four days; in the meantime, although we only consume half-rations, the weight to be dragged has been much

diminished (by about 154 lb.), and for some days we shall have to sacrifice more dogs.

The choice of the victims becomes more and more difficult and disagreeable. At first the weaker dogs were got rid of, then those which were least willing to pull; afterwards, those which had an incorrigible habit of gnawing their harness and the traces, or of escaping at night and not letting themselves be caught in the morning. Some of these brutes were remarkably cunning; they always remained crouching in the midst of the others, until they saw us come out of the tent to get the sledges ready, when they slipped away, like cats, to a distance, where they often hid themselves behind some salient piece of ice; and I have remarked that the number of these rogues was greater after a very fatiguing march. At present, however, whether because they have become more tame, or because they have understood that they must earn their rations, we rarely require to lose any time in catching them. There is still one which, when it is loose, will only let itself be caught by Petigax; it flies away from any other of us, or resists, but it is so strong and willing that I wish to keep it. Dogs' flesh is now eaten by the survivors with almost more greediness than pemmican, even when it is still warm; previously the few which ate it willingly waited till it was frozen.

After dinner, we put the traces and the suits of harness in order; the latter, especially, were in a deplorable state. They get broken by dozens, on days when the dogs are as excited as they are to-day, and it is a great loss of time to mend them, even hastily, while on the march; for this reason we keep the few remaining at hand in a *kayak* to replace, while marching, those which break, but, unfortunately, the suits of harness pass away faster than the dogs. We work almost until midnight.

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On the whole, after the many windings which the pressure-ridges and the channels forced us to make to-day, we have not advanced towards the north more than eight miles. The wind is now blowing strongly, and raising much drifted snow; the thermometer marks -21 . Our sleeping-bag, however, is dry, and it is a real pleasure to warm oneself after so many hours of fatigue.

Friday, April 6th.—The wind is still from the south-west, and we cannot see fifty steps before us, but the air becomes clear about half-past seven, and we harness the dogs; the sun comes out, and the temperature rises to -26° . At ten the greater part of the convoy is marching over very good snow.

The dogs are quieter than yesterday, and we get on well, meeting with hardly any obstacles until two o'clock, when a broad channel prevents us from reaching a large expanse of level ice towards the north-north-west, while to the north and the north-east our way is closed by a barrier of rugged ice, which, though it does not extend more than 300 yards, could hardly be crossed, even by men unhampered. We are forced to retreat some distance and to turn to the east; about an hour is lost making this circuit, but at a quarter-past three we are again marching towards the north, over a channel which has not long been frozen, and in the midst of ice which is continually cracking, opening, and closing up again. The salt on the new ice tires the dogs very much.

At half-past four we find that our way is closed on all sides, by a wide and very long channel in the shape of a horseshoe, in the curve of which we are caught; if we were to go back for about a couple of miles we should perhaps meet with other difficulties to stop us. I prefer, therefore, to wait here till the channel freezes or closes up, and look out for a spot to encamp—a rather difficult and even dangerous matter. After much search, we find

on the banks of the channel a strip of ice covered with a few inches of snow in the midst of some *séracs*. We pitch our camp there as best we may, hoping that to-morrow we may be more fortunate. The wind has quite subsided, and the thermometer marks -33° .

Saturday, April 7th.—The channel is not frozen sufficiently hard to bear the sledges, but we find a place where some masses of ice have clung together and allow us to attempt to pass; but to



"WE PITCH OUR CAMP THERE AS BEST WE MAY"

reach this point we have to cross some ice which is much broken and very difficult.

At half-past eight Petigax and Fenoillet begin to level the place, and Canepa and I bring forward the sledges, one by one, up to the most dangerous part. By ten the obstacle has been successfully crossed, and we have before us an extensive level tract of this year's ice, over which we go swiftly until two, stopping only for half an hour to take a meridian altitude.¹

¹ $83^{\circ} 54' 2''$ N. lat.

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The latitude observed corresponds within a few miles to that which I had calculated. This means that my estimate was tolerably correct when reckoning the number of miles we have travelled, and that the great difference we found during the first two weeks of our march could be set down to the drift of the ice, which was probably stopped as soon as it met with the southerly winds.

We cross at great risk, but without mishap, a channel more than ninety feet wide, the bank of which we had been following for an hour and a half, and then traverse another large expanse of new ice, which tires the dogs very much. At half-past four we cross two more channels, which are not very wide, and then enter an old ice-field, where the saline efflorescence has disappeared beneath the snow, and the dogs eagerly slake their thirst. The poor beasts are worn out with fatigue, but we have travelled fully ten miles. We encamp.

Fifteen days like to-day and we would be in a position to make a final effort! The wind subsides, and with the temperature at -30° we are very comfortable. It seems to us as though the summer had come, and this is not an exaggeration of the sensation we feel. The sleeping-bags, however, are again half-frozen; and we can only hope that we may not be quite frozen, as we were before.

We saw on the ice to-day, between the two channels, the very recent tracks of two bears, one large and one small.

On going into our sleeping-bags, we celebrate the crossing of the 84th parallel of latitude with a sip of rum from the medicine-chest. It is so long since any alcohol has passed our lips that it seems to us as though we drank fire.

Sunday, April 8th.—The weather is very fine at four o'clock; but at half-past five, when we get up, an icy breeze from the north

makes the air feel cutting, though the thermometer marks only -27° . The air becomes murky, and the sky remains overcast all day.

At eight o'clock we are on the march, and make good progress for an hour; a channel which opened last night or this morning stops our way; at certain points it is not more than three feet wide, but the presence of water renders it impossible for us to make the dogs cross it. After seeking in vain for a passage both in the east and west, we build a bridge of large slabs detached from the *séracs* round us, and over this masterpiece of engineering made by Petigax and Fenoillet the sledges pass.

At a quarter-past ten we start again, over a wide expanse, and with the exception of two short stoppages, one for a quarter of an hour caused by a ridge, and another for ten minutes caused by a canal, we make rapid progress until three, over very good and very hard snow.

Towards mid-day, the north wind shifts round to the west, and then blows very strongly from the south-west, raising drifted snow. It now begins to snow also, and about half-past three nothing can be seen fifty steps off. The light becomes more uncertain and we cannot see where we put our feet. Marching has become a torture.

At four we pitch our tent under the shelter of a great hummock. I calculated that upon the whole we have travelled about ten miles in the right direction. At seven the thermometer marks -21° .

Monday, April 9th.—We set out this morning at half-past eight in tolerably clear weather over ice which is fair, and very good snow. At half-past nine we stop for a quarter of an hour to cross a pressure-ridge, and for half an hour at eleven on account of a channel, over which we are able to make a bridge of ice.

The sky has been overcast since this morning, and the air has

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now become thick. It begins to snow, and after mid-day a southeasterly breeze raises up much snowdrift. About two we have to stop, as it is impossible to proceed on account of the fog. We encamp while waiting till it clears; at whatever hour that happens we shall start again.

Since this morning we have travelled five miles towards the north; the occurrence of this bad weather, just when we find the ice in the best condition, is truly unfortunate.

Since the day before yesterday the dogs are very weary; several of the best of them ate nothing yesterday, and we feel very uneasy; woe to us if their help fails us! it is absolutely necessary to us whether we go forward or retreat.

Tuesday, April 10th. —We all watched during the night by turns in the hope that it might clear up, but in vain. There is still snow and darkness, and the wind has shifted to the south-west.

At eight the weather shows signs of improving; we harness the dogs, and at twenty minutes to ten are already on our way. With the exception of a short stoppage for a quarter of an hour, caused by a channel which we cross by the usual bridge of ice, in building which we have now acquired considerable experience, we make rapid progress up to half-past one over fine level tracts of ice covered with hard snow. It would have been a real pleasure if the wind had not shifted to the north-east and stung our faces.

At noon the air has become dark again, but the surface of the ice is so easy that we can keep up the excellent rate at which we are progressing. At half-past one, while crossing an ancient pressure-ridge, we have to go slower; we are almost out of it, and the weather clearing up allows us to perceive before us a plain extending as far as the eye can see, when a broad channel from east-south-east

to west-north-west stops the way. To right and left are large belts of very rugged *séracs*, among which I hesitate to risk myself after the painful experience of last week. I resolve to encamp, and to wait until the channel freezes or closes up. If that happens we shall soon regain the three hours we lose this evening.

The wind changes to the north; the thermometer falls to -32° , and the atmosphere becomes clear. We have travelled to-day five miles and a half, and I consider that I am at $80^{\circ} 20'$. It is discouraging, but all hope is not lost.

Wednesday, April 11th.—We rise at three; the channel is frozen, but the crust of ice is too thin to bear the sledges. At six we succeed in crossing it at a spot where it is narrower, and where the ice breaks after we have passed, and half an hour later we are on the fine level tract we saw yesterday evening.

I have totalled, as usual, the times of our stoppages, even the shortest, minute by minute, and reckoning a halt from eleven till a quarter-past twelve to eat our pemmican, and another of an hour and a half to open a passage through a broad ridge which stopped our way at half-past one, we remained standing for three hours and fifty minutes in all. We marched until four o'clock, so I calculate that in the six hours, during which we made several rather quick marches, we travelled about fifteen miles. If I deduct the distance lost by some short diversion to the north-east, I consider that I have advanced about twelve miles towards the north—a satisfactory day for the distance travelled, but still more so for the number of hours of practical work.

I never felt so fresh myself as to-day, when it was time to pitch our camp, and yet for three days I have suffered much from indigestion, caused, I believe, by the pemmican, for which we have perhaps eaten too much in order to spare our other provisions.

Petigax, too, had pains in his stomach yesterday, and I have diminished the pemmican served out in the proportion fixed for each ration. Two doses of laudanum have done me good, but I am not yet quite cured. The forefinger of my right hand has tormented me continually for some days, but I never uncover it for fear of irritating it, and because that would be of no use, as I have neither the time nor the means to dress it; I shall look at it on the day I return. Will it be a lucky or an unlucky day? I still hope, I always hope, and to-day increases my hope.

At four o'clock the sky became clear for a moment, and the sun appeared with a splendid halo—blue, green, yellow, and red; and a secondary halo—green, yellow, and red. At six o'clock the temperature is -28° , and the sky again overcast.

Thursday, April 12th.—This morning, at seven, while raising the camp, a strong pressure piles up, at not more than a hundred yards from us, a regular wall of ice from thirty-six to forty-five feet high; it is the highest pressure-ridge which I have yet seen. Enormous blocks of ice roll down in our direction with a loud crash, after having been thrown up by other blocks, lifted to the brow of the ridge as if they were straws, which roll down in their turn. Their fall raises a cloud of ice-dust which envelops and whirls round the base of the pressure-ridge. The loud and continual creaking of the pressure is drowned by the booming of this immense cascade of blocks, which makes the ice on which we are standing tremble. It is an imposing spectacle, but we make haste to harness the dogs, which have become very excited, and to withdraw as quickly as possible.

Soon after beginning our march, we crossed two or three lines on which ice pressure was taking place. The sledge carrying the sleeping-bag upsets on one of them, and Canepa and I work

desperately to lift up and pull it away, while large pieces of ice begin to roll between our legs.

By the expression "lines of pressure" I mean the first stage of the formation of a pressure-ridge, which is not always raised up. The edges of the ice-fields, pressed one against the other by the wind, a current, or the impulsion of the surrounding fields, form first of all a swelling. As the pressure continues, if the resistance of the ice of the two fields is nearly equal, the edges begin to rise one against the other like two immense slabs, which then bend outwards, each to its own side; and from their upper ends, which break by their own weight, are detached other slabs or great blocks according to the conformation of the ice and its thickness. Thus is formed a ridge which, in the case of a long continuance of the operation just described, becomes still broader and higher, rarely, however, exceeding the height of twenty-five or thirty feet. When the pressure ceases, the fields often separate and recede from each other; the ridge then sometimes sinks quickly, but often remains supported by one of the fields, and more or less in a state of ruin.

A succession of numerous pressures in every direction often piles up a great number of these ridges, and this occurs especially on the very old ice-fields, which may be twenty-five or thirty feet thick. These accumulated ridges, which rise up over each other and become twisted under the incalculable force of the pressures, form extensive belts of ice which have the appearance of being overturned, like the fall of some enormous glacier; I therefore frequently employ the word *sérac*, perhaps improperly, to designate an assemblage of great pieces of ice, bristling with pinnacles or rounded off, of every shape, which lie heaped up or scattered about confusedly over a certain space, so as to render it difficult to cross.

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A hummock (a word to which nothing corresponds in the terminology of our glaciers) is rather a large isolated block of ice, the remains of a former ridge, or a floating island of ice of a preceding year, caught between two fields and frozen to them. Snow, drifted snow, and wind cover, hide, and round off its hollows and pinnacles, and these great blocks often seem like large swellings. The strongly marked undulations which are met with are only the remains of the great ridges of past years.

Our progress to-day has been exceptional! From eight till a quarter to twelve, we marched always at a good rate, stopping only about forty minutes at the crossing of some small ridges and two channels. After taking a meridian altitude¹ we proceed again after a few minutes and advance quickly over a succession of fine expanses of level ice until about half-past two. We then slacken our march for a little, while crossing a belt of broken-up ice, beyond which lies an immense lake, frozen recently, certainly not more than a week. It is strange how such a vast pool of open water can have been formed and preserved while the wind changed so often. At any rate it is welcome. While on the saline efflorescence, the dogs become tired, but we go on at a good rate without interruption, and precisely in the direction we wish.

It is certain, that if we were surprised by a strong pressure when in the middle of the lake, it would end badly, and we therefore urge on the dogs, which are almost worn out with fatigue—especially those attached to the sledge carrying the sleeping-bag and the tent. Moro, who belongs to the leading team—a strong and willing dog—has its tongue hanging out and is wheezing, but still pulls with all its might. Canepa harnesses himself to this sledge as a reinforcement, and I drive on the four others, beating

¹ 84 29' 2" N. lat.

the dogs with a piece of rope, and at last we almost run, for we see the thin coating of ice over the lake breaking in some places and the water welling rapidly out of the cracks. We are all breathless, both men and dogs, when we reach, at a quarter-past four, the slightly stronger ice which forms the borders of the lake. After ten minutes' rest we set out again, and at a quarter to five overtake Fenoillet and the sledge which has always preceded us by half an hour.

Petigax has gone to seek among the neighbouring *séracs* for a place to encamp; it is hard to find one. The pressure of the ice is again beginning to make a loud noise and that dissuades us from staying at the foot of these recently formed ridges. To our right, a branch of the lake runs towards north-north-west, but a recently opened channel prevents our reaching it. On this side of the channel is a stretch of level ice. We pitch our tent exposed to a fresh south-easterly wind which has just risen.

The thermometer indicates -32° , but what matter? We have travelled to-day no less than twenty-two miles, and after noon certainly twelve, so we ought to be at $84^{\circ} 40'$ N. lat. We are enthusiastic about it, and I willingly concur with the suggestion made by Petigax that we should celebrate our excellent march with a sip of rum.

For two days we have diminished our ration by a quarter, cooking only three rations for all, with the exception of the pemmican, of which I serve out an entire ration. I thus make sure of saving ten days' provisions, which I shall certainly want if, with the help of God, a final effort can be of any use after the 20th of this month. That is the date assigned for the beginning of our return, although I have not definitely fixed it. We do not even

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speak of coming back on the 1st-th, and in fact we have never mentioned it, though the thirty-five days' march towards the north ends on that day.

The wind shakes the tent, and we hear the pressure of the ice thundering round us, but the dogs are not disturbed and do not bark. One might imagine that there is not one near the tent. It is a very unusual occurrence. Poor, courageous brutes!

Friday, April 13th.—There was a fresh south-easterly wind all night and in the morning it blew a gale, accompanied by snowdrift and darkness. The air becomes a little clearer after nine; we breakfast and harness the dogs.

We have to go about 200 yards towards the east, to cross the channel which stopped our way yesterday evening, and then we proceed altogether on the arm of the lake which trends towards the north-north-east. After more than an hour's march we are stopped by a barrier of new ice, which is very high, and at first sight seems difficult to cross. We already form evil presentiments for the day, but after yesterday's march feel almost resigned; it would only form a counterpoise. When, however, we get past the ridge, which hardly made us lose a quarter of an hour, we find a succession of wide expanses of this year's ice, level and covered with a thin layer of hard snow, over which we travel better even than over the large lake.

While we were taking our sledges over the ridge, Fenoillet and Petigax made a great advance with theirs. At half-past four we see them in the distance making signals; we hasten on and reach them. Petigax, deceived by the evenness of the snow, sank suddenly into the water, and if his companion had not given him immediate assistance it is very probable he would have been lost. I put up the tent, beneath which, while the guide is

"WE PITCH OUR TENT"



changing his clothes, I make some coffee, in which we steep a biscuit, to be divided among the four of us. A poor luncheon, but it is all that we have been able to save from our breakfast this morning.

At five we set out again, as it would not be prudent to encamp on this ice. Shortly after I take half a bath, but the water does not penetrate to the skin and I go on without changing. The wind freshens; it snows, and the darkness returns, but the level ice on which we are now allows us to go on. We are stopped for a quarter of an hour by a channel, which is opening and closing like a bellows, which we can only cross by waiting, each sledge in its turn, for a favourable moment. Fenoillet, too, slips with one leg into the water, but continues to march; it is decidedly a day for baths! After crossing the channel we have always level ice and excellent snow. The dogs are tired, but with a few blows they pull very well, and we proceed thus at a good rate until nine.

Since six o'clock we have not stopped more than half an hour altogether, and I therefore believe that I am within the truth when I calculate our day's march at from twelve to thirteen miles, and our latitude this evening at $84^{\circ} 50'$. I told the men jocularly yesterday that in three days we might be able to reach the 85^{th} degree of latitude, but if we have a good day to-morrow I shall have foretold truly. I did not seriously expect this when I spoke in this way.

We spread our tent near the first hummock met with a little snow round it, which shelters us from the south-west wind; we are so near a large fissure that we run the risk of falling into it every time we leave the tent; but we are so well satisfied that we would be content with less even.

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The fog hides the horizon from us, but we hope the level ice still stretches away beyond that opaque veil. The wind has gone round to the east, it snows, and the temperature is -17° ; at midnight we are still on foot, and busied in scraping the ice which has formed after our baths off our leggings and our shoes. The soup is excellent, and our hopes rise like the vapour which ascends from it.

Saturday, April 14th.—We woke up very late, and had to mend three sledges, two of which were seriously damaged, and had to be unloaded. This made us lose much time and we only set out at 3 p.m. Half an hour later, a channel opens between us and Petigax and Fenoillet, and then another, and we do not all meet again till an hour after. It would have taken us longer to do so had not the ice, after separating us, brought us together again by its movement.

It is a fine day and there is a light breeze from the north. The snow which fell last night has made travelling very bad, and the dogs, already very tired, will not draw, but stop every fifty steps. We beat them to force them on, and it is very hard work, which hurts the back, to push the sledges forward every moment, because the dogs will not start when they are bid.

When a sledge has stopped, the dogs have some difficulty in moving it again, in consequence of the runners sticking to the snow; we have therefore to stoop down to seize the runners and raise the sledge slightly before or behind, or move it from right to left, making the dogs go on at the same moment.

The word which Trontheim taught us to induce them to start is *brrr*, and to stop, *sasss*; and well-trained dogs like ours generally obey these sounds. But to-day we shout *brrr* in vain; the dogs take things easily; one pulls, another does not,

and so the sledge does not advance. We have to stoop a second and even a third time to raise the sledge, till at last it starts. We now breathe freely; but there is the sledge which follows stopping in its turn, and we have to again begin with *brrr, brrr*. Considering that Canepa and I have five sledges to drive, it is easy to imagine how many hundreds of times in the course of the day we have to stoop and push, and turn back and run forward, in order that the convoy should not stop altogether. It is the result of the



" THE SNOW WHICH FELL LAST NIGHT MAKES OUR PROGRESS VERY BAD "

efforts which the poor brutes have made during the foregoing days, and in order not to exhaust them completely we encamp before eight o'clock. We have luckily always had level ice, and have travelled altogether from four to five miles.

Sunday, April 15th.—The sky is dark, the wind blows from the north, and then very strongly from the north-east, accompanied by much snow; we cannot see, and it would be impossible to set out. I do not much regret it, for I think that the dogs

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could hardly have gone farther without a day's rest. Yesterday evening very few of them ate their pemmican, an evident proof that they were exceedingly fatigued.

We take advantage of the halt to repack the loads, to mend two sledges again, and to unload completely the one most damaged, which I have decided on abandoning. While the guides are busied with this, Canepa and I put the traces in order and as many sets of harness as it is possible to patch; I cut out and repair the straps, whilst Canepa sews them.

I then decide on unbandaging my finger, which has not let me sleep for two nights; Petigax assists me. The end of the finger is half petrified; the nail is turned back and wounds the flesh. I took away with the forceps as well as I could the pus and dead flesh; then washed it with a strong solution of sublimate, and bandaged it again, but now it hurts me more than ever. I fear that it is in too bad a condition to resist the temperature of -30° any more, and against which I have no means of guarding myself, especially with this wind. If we wish to make any progress, I too have to work, and must make more or less use of my hand while working.

While I am getting the dinner ready, a hole appears in one of the saucepans: the bottom is burnt through. We are terrified by this accident, for with only a single saucepan (and how long will that one last?) much time will be lost and petroleum consumed. We eat slowly, saying every now and then, "What can we do to mend it?" Among the different suggestions, that of Fenoillet is approved of; at that moment it seemed a flash of genius—it is to make use of the cover as a second bottom, and this is no sooner said than done; the inventor of the device sets to work with Petigax, Canepa finishes the sewing of some sets of harness,

and I write in my pocket-book, and, as usual, reckon up miles and rations. At half-past nine the saucepan is mended; it has the drawback of being of white metal instead of copper, like Nansen's; in shape it is luckily somewhat like a truncated cone, and when the cover, which is wider than the bottom, was placed underneath, it could be hammered down upon it all round. To try if the vessel would hold, I offered Fenoillet some punch as a reward—a pint of water, half a spoonful of rum, about half an ounce of sugar, and three drops of lemon juice. We were cheered when we saw that the second bottom hardly let a drop escape.

To-day we threw away our Jaeger jackets, which had become very heavy, a large quantity of ice having been formed in the meshes of the stuff; it will be about thirty-three pounds less to drag.

We cannot say that the day was quite lost. We executed repairs indispensable to the sledges and necessary for the sets of harness, which were in pieces; the dogs, to which we gave only half a ration, had a rest, and we remedied the rather serious accident which had happened to the saucepan—an accident which perhaps we would not have attempted to remedy after a march. We recite the prayers of the Feast Day, and at a quarter-past ten are in our sleeping-bag.

There was a strong north-east wind until nearly four o'clock; then it began to subside, but the snow continued to fall. The thermometer, which to-day was at -26° , rose to -11° at nine this evening. Let us hope that the bad weather we had at noon may not return.

Monday, April 16th.—The weather, which seemed to improve at 2 p.m., shortly after became worse. The snow is falling heavily and there is a stiff breeze from the south-east. We

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can see nothing, and it would be dangerous to risk ourselves in this weather on the expanses of new ice, of which we got a glimpse to the north the day before yesterday, and, above all, it would be useless, as we could make no progress.

We renew our experiment on the saucepan, after having boiled some pemmican in it, with very little water, to stanch with its fat the little holes which still existed, and our plan succeeded wonderfully well.

While watching the weather, we pass the day in mending our *finškos* and clothes. With the help of the cross-bars of a sledge, Petigax makes rather higher supports for the cooking-stove, so as to keep our other saucepan farther away from the flame, and thereby prevent its being burned, as the bottom is already worn. Meanwhile we talk about our future; and from the way my men speak, I am now persuaded they are ready to make any sacrifice in order to reach our goal. I am therefore less annoyed by our stoppages of yesterday and to-day than I was by that of last week, when I had not so clear an idea of the determination and zeal of my companions. What matter two days more or less, if they all follow me with enthusiasm? The fine weather will come back, if not to-night or to-morrow, for certain in a few days. Time presses, it is true, but all hope of achieving something is not yet lost.

Tuesday, April 17th.—I rose at 3 a.m., as the atmosphere seemed about to become clearer. The wind has turned to the south; a few rays of sunshine pass through the clouds. I lit the cooking-stove and the men got up; but when we were about to harness the dogs, snow and a thick fog fell again, and the barometer, which had begun to rise, goes down.

I put off our departure once more, as it is too dangerous

to push blindly on. A sledge—or worse even, a man—may be suddenly lost in some channel covered by a deceptive layer of snow, without any possibility of giving assistance. I prefer to lose another day rather than expose ourselves to such a risk.

To-day is the thirty-eighth day since we left the hut, and the thirty-sixth since we began to use our own provisions, after sending back the auxiliary detachment. It is understood that we shall go forward until the 20th, three days more; but if in three days we should be still here? Such a misfortune seems to me impossible; it would be too cruel. Yesterday evening, when in the warm sleeping-bag, while falling asleep with my head uncovered, outside the bag, I was still dreaming golden dreams. On the other hand, the present moment seems to me to be the beginning of the end, the sad end of all my dreams, and there rises before my mind the possibility of a complete failure, which will render useless so many sacrifices. The men, too, are unresigned. In the two hours we have been waiting for the weather to clear, we have not said twenty words. Every five minutes one of us leaves the tent to observe the weather, and comes back in silence, which means that it is still snowing, and snowing heavily. The more we delay setting out, the worse the snow will be, and we shall sink in it half-way up our legs. We have before us the sad prospect of a useless struggle, for the many hopes which yesterday evening still sustained our courage are on the point of being shattered by the cruelty of an evil destiny.

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Midnight.—We have just done dinner, ten miles to the north of where we encamped this morning. A north-west breeze rose at 10 a.m.; for five hours we had been crouching in silence at the bottom of our tent, looking out every moment. The tem-

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perature, which at six o'clock was -8 , fell slowly, and when the north-west wind rose it was -11° . We had lain down in the bag to rest our backs. At 2.30 p.m. the sky began to clear. We jumped up, and whilst I was getting the soup ready, the men harnessed the dogs. We made such feverish haste that we were on our way before four o'clock. The sledges glided along very much better than we could have hoped, as there was a foot and a half of soft snow. It was a pleasure to see how the dogs ran; they had been rested, and they left us behind in order to overtake Petigax and Fenoillet, who had gone on before without a sledge, and who were roped together to guard against any disagreeable surprise. At half an hour's distance from the camp the guides come suddenly to the edge of a channel covered with snow, which they discover only by a slight depression, and by striking it with the pick-axe. We had, therefore, to feel our way, to cross safely. That takes a quarter of an hour, and then we travel over a splendid expanse of level ice without the slightest obstacle until 10 p.m.: during that time we stopped three times to let the dogs take breath, in all for a quarter of an hour. A wide and very long channel, which we cannot cross, stops our way; it must have opened to-day, for it is not covered with snow. The sky is quite clear, the air pure, the temperature -31° , and the wind has shifted to the north. All this makes us hope that the channel will freeze in a few hours, and that we shall have a fine day to-morrow, because we see that this plain continues towards the north-north-west, while to the north and north-east extends a wide belt of ice, which has been recently broken up. We feel the cold somewhat, but we are so pleased! We have crossed the 85th parallel.

Wednesday, April 18th.—The wind is raging furiously. It

shifts to the west, and then suddenly changes to the north-east, blowing violently and bringing snow and fog. It is infamous weather. We have not the courage to look at each other, nor do I feel able to inspire my companions with vain hopes. It clears up at 8 p.m., and we have no hesitation in harnessing the dogs and setting out, although we had only one meal at noon. We cross the channel, which is now perfectly frozen (it took plenty of time), and travel until midnight, while the drifting snow blinds us and the dogs refuse to advance against the wind. Then, in attempting to cross a channel, we are caught in a regular hurricane of wind and snow. We pitch our tent, after having advanced a little more than three miles to the north.

Thursday, April 19th.—Before we have been long encamped the wind subsides somewhat, and though it is 1.30 a.m., we feed the dogs, which have fasted for twenty-six hours, as we hope soon to resume our march. The weather seems likely to allow it; the wind shifts towards the north and the atmosphere clears up quickly, but while waiting till the dogs have done eating, the north wind increases in violence and raises a thick snowdrift. The temperature falls to -32° , and it becomes intolerable to remain in the open air, especially with our faces to the north.

And here we are at mid-day again crouching under the tent, waiting for a calm which does not come. Seized, I might almost say overcome, by a great moral and physical lassitude, we pass the day dozing, lying across the sleeping-bag.

At 7.30 p.m. the tent suddenly ceases flapping. Luckily, we have already eaten, and at a quarter-past eight we start. The channel we met yesterday has been closed up by the pressure of the ice. We go on until ten, with hardly any difficulty. The wind has completely subsided. We meet a wide channel,

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with several ramifications, very difficult to cross. We find, however, a spot where we can attempt it, by means of some work which Petigax and Fenoillet execute; but our passage is hardly cut, when the ice-fields, between which the channel lies, move away in opposite directions, and our labour proves vain.

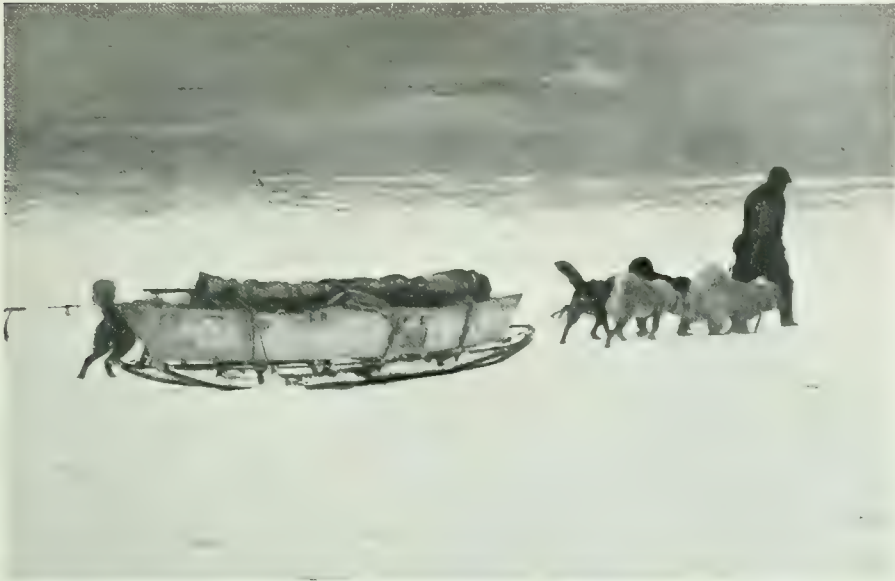
When the movement, which lasted only a few minutes, appears to have ceased, we begin to construct another crossing. It is already getting on well when the ice moves, and all our toil is again lost. It would seem as though it were done on purpose. At last we succeed in conveying ourselves, together with all the sledges, upon a large ice-floe floating between the two banks of the channel; and from it, after some hasty preparations made by the guides, by a piece of good luck we reach the ice-pack on the opposite side. While the last sledge is crossing over to the solid ice, the channel opens out still more, and all the work of Petigax and Fenoillet is destroyed. We have lost an hour; but from eleven till midnight we proceed in a straight line over level ice without stopping a moment.

Friday, April 20th.—We continue to make good progress until 1 a.m., when we are stopped by a very wide channel. It is partially frozen, but in the centre is a strip much too thin for us to risk ourselves upon it.

For two hours we seek in vain, both to east and to west, for a crossing. The channel is so long that we cannot see the end of it in either direction. The weather is fine and cold, and the channel may be well frozen in four or five hours. I give orders to encamp; it is now past three. The temperature is -29 . From north-east to the south a long and very broad dark stripe—a certain sign of open water—stretches across the sky.

At 1 p.m. we are able to cross the channel, now completely

frozen, and beyond it we find an ice-pack of old ice, level and sprinkled with isolated hummocks, between which we pass freely. Then after two or three small pressure-ridges, which we cross without having to use the pick-axe as the snow heaped up on both sides forms a gentle incline without any lumps, there appears a plain. But such a plain! A true white desert, without an undulation, without a block of ice, which seems to have no limit.



"A WHITE DESERT, WITHOUT AN UNDULATION"

The snow is tolerably good, and we progress at a rapid pace till eight, stopping rarely and then only for a few minutes. We have travelled no less than sixteen or seventeen miles, and both ourselves and the dogs are very tired, but we have the whole night to rest.

According to my calculations, fifteen miles will bring us very near $85^{\circ} 30'$ N. lat. To-morrow evening I shall decide either to return or make a supreme effort. If we have another day like this, all hope will not be lost, and the ice before us seems to

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continue to be tolerably good, if not so excellent as here. It is an undulating plain, with rounded hillocks.

The sky is clear, the atmosphere pure, and the temperature -39° . Everything gives us reason to hope, and when we enter our sleeping-bag, about eleven, we feel as though we are quite other men than yesterday.

Saturday, April 21st.—Our dreams and hopes, which two days ago were still very uncertain, rise again full of life and brilliancy, and fill us with a joy never before experienced in these regions of suffering and desolation!

We set out this morning at eight, with very fine weather; we cross a small belt of undulating ice, without meeting an obstacle, and beyond it stretches a plain, another desert, but more extensive and boundless than that of yesterday. At a quarter to twelve we stop, and while the men make some coffee, from what they saved this morning, I take a meridian altitude and make the calculation hastily on the snow. We are at $85^{\circ} 29'$, nearly where we thought we were by our reckoning; the fact excites great enthusiasm among all of us, but especially in Fenoillet, who is usually very undemonstrative. I took also an azimuth observation, which gave me 0° for the variation. At half-past one we are again on the march. As we advance, the snow becomes harder; the dogs never went so well as they are going to-day; and we proceed rapidly, at the double, without any incident, until six. We perspire, although we have had our *anorakers* off since morning. We meet with a broad channel recently frozen, which we cross without any difficulty and encamp on the other side, sheltered from a breeze from the north by a bank of ice, which marks the boundary of a small belt of ice-pressure. Beyond this we still see the white desert.

Since mid-day we have travelled not less than twelve miles, and are therefore encamped at $85^{\circ} 44'$ N. lat. The temperature is -29° ; the clear sky and the northerly breeze promise more fine weather, and the ice in front of us is level.

Very naturally, the idea of returning does not enter my mind, but it is only just that I should mention it to my companions, whose life, closely connected with mine, is in my hands. After dinner, I lay before them our present situation and my projects.

"We have still provisions for thirty days, which, by reducing the rations, may suffice for forty-four—that is to say, until the end of May. If we go on for another week, we shall be back here with provisions for thirty days at reduced rations. It is true that we have taken forty days to come to this camp, but in going back we may reckon on a much quicker journey, because the temperature will be milder, the number of sledges smaller, and we shall have greater experience. Now, with six or seven days' marching like yesterday and the day before yesterday, we might obtain, if not complete success, at least a very satisfactory result. On the other hand, a prolongation of our march forward may expose us to great privations while returning, and perhaps even to serious danger if we were unfortunately overtaken by a snowstorm. The thirty miles which we have done in two days might not perhaps be travelled again in four, and if our return were slow, we should not only want provisions, but might be surprised by a thaw, an event which might prove fatal."

Having thus shown the arguments for and against making a final effort, I asked the men for their opinion. They cried out unanimously, "Forward! Let us go on till we reach at least the 87th degree of latitude!"

Will God abandon us just at this moment? I am full of

hope, and these three men, for whom I feel a sincere admiration, are as well.

Sunday, April 22nd.—We rose this morning at five, feeling a slight heaviness, as often happens after coming to important decisions. I reflected much last night, and renounced one of my golden dreams which still survived, and did not seem to me quite impossible to realise. "To reach the 87th degree" we should have to do about a hundred miles in a week, which would be difficult. But even supposing that we succeeded, we would not be certain of covering the same distance on our return. It would be such an unusual and extraordinary feat that we could not be sure of it. And if, while we were eighty miles farther to the north, we should be surprised by bad weather, what would become of us? To-day we can reckon on forty-four days' provisions, but at reduced rations, on which no sort of saving can be effected without weakening the men. And in the silence of the night, lit up by a bright and unclouded sun, this argument always came back to my mind more clearly, more precisely, more powerfully, and overcame little by little all the resistance offered by my ardent wishes, my ambition, and the highest ideals of all of us. I decide that I shall return as soon as I reach $86^{\circ} 30'$, even if I were to get there in a very few days. I have hardly come to that decision when I am assailed by a doubt; shall we reach even $86^{\circ} 30'$?

We start at nine and cross some ice sprinkled with blocks and small hillocks, which do not oblige us to deviate much from our path. At half-past ten we are on the edge of a large expanse of water, which we call the Lake of Como. It is well frozen, and we take more than an hour walking quickly to cross it. There is not much saline efflorescence on it, and it is not

sticky; the dogs cross over it without stopping, and oblige us to run to keep up with them. While they are resting on the other shore, I take a meridian altitude, although this morning I had resolved to take no observation, so as to avoid a loss of time. But the sun is unclouded, the horizon clearly defined, and the opportunity is favourable. When we are again on the march, I make the calculations mentally. Since noon yesterday, and also this morning, we must have travelled more than I had reckoned. We are at $85^{\circ} 48'$ N. lat.¹

As soon as I overtake the guides, who are getting ready a crossing over a pressure-ridge, I announce to them this good news, and Petigax replies with more. On account of the large expanse of water and of some ridges on its banks, we thought that the ice-pack would be uneven, but, beyond these ridges, it appears as it did yesterday. This intelligence, in the state of suspense which we are in, is very consoling. On account of it, and of the latitude, we resolve to take a short rest about two o'clock, and then to try to reach the 86th degree this evening. Fenoillet showed his joy by the shout which he gave to send the dogs on their way.

We stop at ten minutes past two, to take coffee, and at ten minutes to three we are again on the march. We have never succeeded in making it so quickly; even the cooking-stove shares our enthusiasm!

We feared that the dogs might be weary, but they travel very well; they make stages of an hour and even an hour and a half, without stopping for a moment; then they have five minutes' rest, which I time with my watch, and start off again as fresh as when they set out. It is true that the sledges are lightly laden;

¹ $85^{\circ} 47' 39''$ N. lat.

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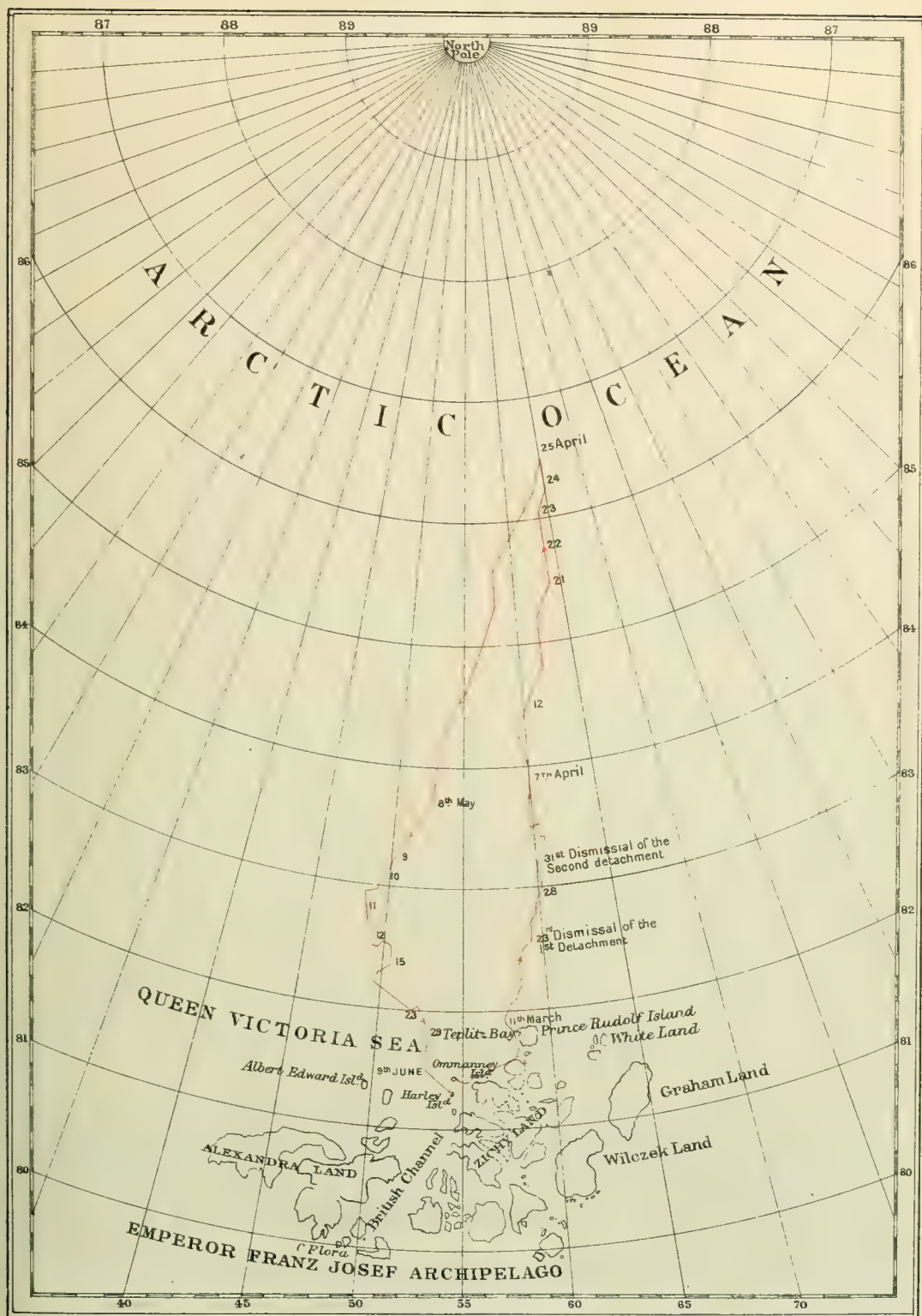
the heaviest, which is always that which carries the sleeping-bag, does not weigh more than 440 lb. including the vehicle; but it is certain that, as shown by our daily performances, all the dogs we now have are excellent; they are for the most part well trained, and know by experience that when they slacken their pace through laziness, our shouts are followed by blows.

We proceed thus towards the north until six, at which hour we approach a very long ridge running from east to west, and as it seems broad, our hearts beat in dread of delay. We cross it, however, without having to work with the axe, in a few minutes. Beyond the ridge is level ice, with a sprinkling of blocks and small hillocks, which, as they partly conceal each other, have in the distance the appearance of forming serried lines; they seem to be more pressure-ridges; this idea, repeated several times, irritates our nerves, and we hasten our steps.

We only stop at half-past seven; we must have done fully the thirteen miles which separated us from the 86th degree. We encamp close to a hillock, in order to have shelter from the south-west wind which rose at mid-day. The sky is overcast, but the temperature remains low, and this makes us hope that the weather will continue to be fine. We feel very nervous, in spite of our fatigue, and have reason to be; we speak of reaching 86° 16' to-morrow if the ice will allow us, and Nansen more than ever is the chief subject of conversation this evening. The state in which we have found the ice-pack in these last three days shows us now, how two men with three sledges were able to travel eighteen miles a day.

It must have been the expanse of water, stretching to the east and the west as far as the eye could see, we crossed yesterday, which reflected on the sky the long broad dark stripe which we

Commander Umberto Cagni's route in his sledge journey
towards the Pole.



saw on the 20th. I believe that if we had reached it forty-eight hours sooner, instead of serving us as an excellent road it would have stopped us, hesitating and disconsolate; and who knows whether we might not have refrained from making our supreme effort, which is on the point of being victorious?

Monday, April 23rd.—We were astounded at our success. The tent having been pitched, I carried the cooking-stove into it, whilst Petigax hung up the pots to fill them with snow. We had not exchanged a word for several hours; I held out my hand to him and we clasped each other's warmly. I thanked him for all that he had done to help me; I wished to tell him that the hand he clasped was that of a grateful friend, but I do not remember what I said to him, nor do I know if he heard me. He replied, stammering, that he had only done his duty, but his voice, like mine, was choked by emotion and, as in mine, tears shone in his eyes.

"The flag!" I said to him, and we left the tent without further thought of the cooking-stove. We searched hastily in the *kayak* for our little flag; tied it to a bamboo pole and I waved it to the cry of "Long live Italy! Long live the King! Long live the Duke of the Abruzzi!" And to each of my cries the others answered with a shout which expressed all the exultation of their souls.

Resound on, sacred words, resound throughout these regions of pure and eternal ice, this sparkling gem! For never shall a conquest won by the sword, nor by the favours of fortune, adorn the Crown of the House of Savoy with one of greater lustre!

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We had set out at nine, by a cloudy sky and northerly breeze which had risen in the early hours of that morning. We had, made good progress until half-past ten, when, in crossing a ridge, the trace of one of Canepa's sledges broke. I was luckily ahead,

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and succeeded in stopping the six dogs before they were able to pass my sledges and follow the track of Petigax and Fenoillet. This accident, however, made us lose half an hour. As compensation, we found a large tract of level ice, where I stopped for a quarter of an hour to take a meridian altitude, and at ten minutes past twelve we were marching across recently formed ice, now beginning to move.

A little later we were in the midst of pressures, which seemed to come from every direction. The ice was creaking on all sides and overlapping, and raising up pressure-ridges with a loud noise; winding channels were opening, and, where other channels were closing, new ridges were rising. I had never seen the ice so full of life, or so agitated, or threatening. The dogs were terrified, they howled and stopped; we urged them forward with our shouts, and hastily helped now one sledge and then another. We overtook the guides at last; they had stopped on a small tract of very old and level ice, which seemed very solid in comparison with the thin ice around it, and there we breathed freely. After a quarter of an hour the pressures ceased, and nothing more was to be heard beyond slight creaking noises, the last palpitations of that great convulsion.

We resumed our march. I had never felt so weary. I could hardly stand; the dogs refused to go on and we had to beat them every minute. At half-past two we found a channel which we crossed, and climbed up on a large block of ice which from the other side of the channel seemed to be attached to the ice-pack, but which was really surrounded by water. At that moment, both ice-fields began to move, and we remained imprisoned on this floating island, which seemed as though it would be shattered to bits by the first strong pressure. For some minutes we felt very uneasy;

we had to escape from thence at any price. Luckily, the channel closed up slightly towards the north. Petigax and Fenoillet lost no time, and by working with admirable cleverness and coolness in the midst of falling blocks, and on ice-floes which seemed about to sink, they made a passage, across which the sledges were quickly dragged to a place of safety.

We sought for some shelter from a fresh south-west wind which had risen, and made our luncheon with coffee. The meridian altitude gave us $86^{\circ} 4'$.¹ We still wanted ten miles to reach Nansen's farthest latitude, and in four hours at most we ought to be able to cover them. We resolved at all costs to attempt to reach $86^{\circ} 16'$ that evening.

At half-past three we set out again. We had at first wide expanses of level ice, then new ice, and then a frozen lake. The dogs seemed to have felt great relief from the short rest, and pulled willingly without stopping. I, too, was completely freed from the strange and sudden fatigue of this morning. We twice crossed the lake, which was curved in the shape of a gigantic horseshoe; with its convexity turned towards the east, and came upon a level and smooth ice-pack, sprinkled over with blocks of ice, at the beginning, and then without any elevation or ruggedness.

Petigax and Fenoillet walked singly, about a hundred steps ahead of the convoy, which went on in silence, leaving behind it two furrows, which faded away in the distance. Every now and then I looked at the time; in spite of the rapidity of our march, we advance for more than an hour, or an hour and a half, without the briefest halt, then, after five minutes' rest, on again. Seven o'clock passed, eight o'clock passed, and still we went on. We must have covered much more than ten miles, but at that moment

¹ $86^{\circ} 3' 48''$ N. lat.

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I hardly took note of this. I did not even think of it. The absence of all obstacles, the sameness, the monotony of the march had stupefied my brain, and I followed my sledges, which did not require my help, as though I were asleep. My thoughts wandered far away—far from ice and cold. I was among green trees and in a warm climate. . . . I was dreaming. . . .

During our short stoppages we looked at each other, smiling, but none of us spoke; it seemed to us as though our voices might break the charm which was leading us on to victory.

Nine o'clock passed; Petigax had taken the leading place, and, walking with long strides, had left the convoy behind; the sledges sometimes drew nearer to or fell back from each other, but never stopped. The sky had become clear, the wind had again shifted to the north, and here and there were heaps on the ice.

It was a quarter to ten. My mind came back to the present, and I remembered that to-morrow we should have to travel again. I called out to Petigax and made signs to him to stop to encamp. To our left was a small hillock; we brought the sledges near to it so as to shelter them from the north wind, and drew them up in line; the tent was untied and spread. We did all this mechanically, like automata.

When beneath the tent, at that first moment of repose, when all the fibres of the body seem to unbend and relax after long fatigue, the clear idea of things came back to me. We have conquered! We have surpassed the greatest explorer of the century.

* * * * *

We planted our flag before the tent. I prepared a special soup, made up from all the stores we had; half a biscuit apiece was served out over and above the usual ration; it was

a feast worthy of Lucullus. Then we made punch—real punch, with cognac—and drank to the Duke of the Abruzzi, to the prosperity of our country and to those who were absent.

At one o'clock we were not in bed; we talked about our families, our friends and our comrades; of the satisfaction that they, and still more our Prince, would feel with the work we had performed. More than ever did we feel profoundly grateful



"WE PLANTED OUR FLAG BEFORE THE TENT"

towards Him who had opened for us a path to glory. For that evening, after so many privations and so much anxiety, our enterprise seemed glorious to us. The temperature had fallen to -39° , but we only perceived the cold was so intense when we looked at the thermometer.

Tuesday, April 24th.—We awoke very late this morning. The thermometer indicates -37° . It must have fallen last night

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below -40 . The weather is fine, and there is still a north wind, which pierces the skin.

I decided yesterday evening that I would go on all day and to-morrow until noon; then take the meridian altitude, have our meal, and afterwards try by a single march to return to encamp in this place. I calculate that thus I shall certainly reach $86^{\circ} 30'$.

The men were pleased with my plan, though their eyes showed the desire they felt in their hearts of reaching the 87th degree. But I resist this general wish; I try to persuade all, including myself, that it is merely vanity to want to make up the round number; to the 250 miles from our farthest point north to Prince Rudolph Island we should have to add sixty, almost a fourth of the amount, and that would be too much!

We are not ready to start till a quarter to twelve. I wait till I have again taken the meridian altitude. We travelled yesterday even more than we thought, and performed a really wonderful march. We are in $86^{\circ} 18' 20''$ N. lat.,¹ and the magnetic variation is zero.

At ten minutes past twelve we are on our way to the north. The ice is like that of yesterday, level and smooth, and, later on, undulating. At first the dogs are not very willing to pull, but encouraged by our cries and a few blows, they advance at a rapid pace, which they keep up during the whole march. At five we meet with a large pressure-ridge, which almost surprises us, as it seems to us a century since we have seen any; we lost a quarter of an hour in preparing a passage through and crossing it. Beyond it the aspect of the ice changes; the undulations are more strongly marked, and large

¹ $86^{\circ} 18' 44''$ N. lat.

blocks of ice and small ridges indicate recent pressures, but luckily they do not stop us or obstruct our way.

Soon after six we come upon a large channel running from east to west ; we must stop. Beyond the channel is a vast expanse of new ice, much broken up and traversed by many other channels. Even if I were not prevented from doing so, I would now think twice before risking myself in the midst of them ; I have too



"ON THAT FARTHEST TO THE NORTH WHICH IS ALMOST TOUCHED BY
THE WATER OF THE CHANNEL"

lively a remembrance of my anxiety yesterday morning. On the other hand, after the good march we have made to-day, we consider that we are in $86^{\circ} 31'$ N. lat., and if we did push forward on that ice, even for half a day, we would gain very few miles and besides run the risk of losing a sledge. The dogs are much tired, and we, too, feel the effects of yesterday's strain. I therefore consider that it is more prudent to definitively stop here, and both the guides are of the same opinion.

The sun is quite unclouded. I bring out the sextant and take

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altitudes of the sun to calculate the longitude,¹ while Fenoillet and Canepa put the sledges in order and spread the tent in a sort of small amphitheatre of hillocks, which shelter us from the north wind. On that farthest to the north, which is almost touched by the water of the channel, we plant the pole, from which our flag waves.

We had a repetition of yesterday's feast, followed by a hearty toast to the Duke of the Abruzzi ; while pronouncing it, I feel agitated, and perceive that my emotion is strongly shared by my companions ; after a short silence, our conversation begins again with an animation it never attained before under this poor ragged tent. The idea which recurs most often, and amuses us most, is that of our arrival at the cabin—the surprise the Prince and our companions, who, after the details of our first march, must have lost all hope of our ever succeeding in doing anything, would feel. It is suggested that we should make a great placard, with a piece of the tent, and write upon it $86^{\circ} 30'$, so that they should see it from afar on our arrival. We talk about our homes, and our return to our country. Oh, how the future smiles on us !

We go out into the open air. The thermometer indicates -35° ; but, nevertheless, I see, for the first time, the guides walking up and down after the soup. They are talking of *their* country ! Of their Courmayeur, where at this moment the meadows appear covered with verdure, after their long rest under the white mantle of winter. We all remain outside for a long time, our minds enchanted by our great happiness. We have reached the end of all our fatigues ; our return seems to us now like an excursion, our eyes turn no more with eagerness towards the north, but to the south, where, beyond so much ice, beyond a cold sea,

¹ $65^{\circ} 19' 45''$ E. long.

and the rugged mountains of Scandinavia, and farther on again, our loved ones are waiting for us.

The air is very clear; between the north-east and the north-west there stand out distinctly, some sharply pointed, others rounded, dark or blue and white, often with strange shapes, the innumerable pinnacles of the great blocks of ice raised up by the pressure. Farther away, again, on the bright horizon, in a chain from east to west, is a great azure wall, which from afar seems insurmountable. It is our "Terræ ultima Thule"!



"THE CONVOY IS READY TO START"

To the south, however, stretches away the level expanse of ice, white and sparkling, lit up by the midnight sun.

Wednesday, April 25th.—I was not able to close my eyes last night, either on account of the cold or of my state of nervous excitement; and the men, also, slept little. We rose at seven; we ate only pemmican, and set to work to get the sledges ready. I have decided on leaving one, and we must unload them all; for a part of the pemmican, which has hitherto formed the foundation of the loads, must be taken away, to have at hand when required. When all the loads are made up, the

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heaviest sledge weighs 418 lb., and the lightest, from which nothing is to be taken for some time, 374 lb.

I place in the snow three tin tubes, hermetically closed with wax, each containing one of the usual papers addressed to the Hydrographic Office of the Royal Navy. I have written on the paper "April 25th, 1900. $86^{\circ} 31'$ N. lat. 68° E. long. (I believe that this is correct within a couple of miles.) Having reached this my farthest point to the north, I begin my return journey with provisions for thirty days, 200 rations of pemmican, four sledges, and thirty-four dogs, with 300 rations. We are all in excellent health.—CAGNI."

At eleven we have everything quite ready, and we take our coffee and milk; while the men are packing up the tent and harnessing the dogs, I take the meridian altitude, both with the artificial horizon and the natural horizon, which is very distinct. It is easy to do so on account of the very slight elevation of the sun in this latitude. We are at $86^{\circ} 32'$ N. lat.¹

The convoy is ready to start; I photograph it, and give the signal of departure.

Petigax goes forward, following the tracks made yesterday, and our hearts beat quickly as we take the first steps of our return to our country.

¹ $86^{\circ} 34'$, according to the average of the observations afterwards calculated at the Hydrographic Institute and introducing the exact co-efficients of temperature. See *Scientific Observations taken during the Expedition of H.R.H. Prince Luigi Amedeo, Duke of the Abruzzi*, Part I., report by Commander Cagni.

CHAPTER IV

We return towards the South. Desperate
Struggle with the Drift

CHAPTER IV

WE RETURN TOWARDS THE SOUTH. DESPERATE STRUGGLE WITH THE DRIFT

*W*EDNESDAY, April 25th.—We are now indeed on our return journey ! The dogs seem to know it ; they follow the tracks at a rate we cannot maintain, and I therefore tell each of the men to mount his sledge. It is the first time we allowed ourselves such a luxury. We go on thus for four hours and a half much faster than usual, stopping only twice to let the dogs gain breath. Before five o'clock we are near the little hill where we encamped on the evening of the 23rd, so that we have made the journey at the rate of nearly four miles an hour.

We stop for a few minutes, and then go forward. Our former tracks, which are no longer so hard, and the ice, which is rather undulating, render it more difficult to drag the sledges, and we get down from them very willingly in order not to tire the dogs, and also because while sitting we felt the cold very much, and were benumbed by the north wind, which was accompanied by snow-drift. Although the rate is now less rapid, we very soon warm ourselves in following the dogs.

At seven we come to the crossing over the great horseshoe-shaped lake. Later, the dogs begin to slacken their pace, but we drive them onwards, and advance quickly until half-past nine. The poor brutes pant and their tongues hang out, but we

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can see no possible shelter from the wind on the level stretch of ice where we are; we cross over to the southern shore of the lake, where there is a small pressure-ridge, and on the other side of this we encamp.

It is 10 p.m., and we have travelled from twenty-eight to twenty-nine miles, a good many on our legs. We are all tired and hungry, and as this evening I have not the courage to reduce the ration, I serve it out entire. I think that, even if I were to give out the full ration every time that we travel more than twelve miles to the south, we should have provisions enough to do 360 miles. Only 250 miles now separate us from the island, and we should therefore have thirty-six rations over for the last days, without reckoning the saving which I would continue to effect on days when the journey was shorter.

The thermometer is at -32° , and we sleep at midnight. We find both the reindeer-skin bag and the bags of down completely frozen, as they were a month ago, when they left a bad recollection.

Thursday, April 26th.—We awoke very late this morning, and set out about noon. The dogs, contrary to their usual custom, do not bark when they see the first sledge go off; since yesterday we do not even hear them quarrelling among themselves. They must be very tired, and this we perceive when marching, as we are continually obliged to drive them on by shouting. We cover, nevertheless, a considerable distance with but few and very short rests.

While crossing the new ice which had caused us so much anxiety on the 23rd, I fall into the water, but as I fling myself forward at full length on the ice, I luckily only wet the calves of my legs; but whether on account of this half bath, or of the strain of the last few days, I can hardly stand. I find great difficulty in

following my sledge, and in places where it is easier to pull I hold on to it and let myself be dragged along.

At a quarter to eight we reach the place where we encamped on the evening of the 22nd, and the guides are now astounded at the enormous distance we travelled on the 23rd, which was certainly owing to our nervous excitement caused by the prospect of success.

Petigax had a swollen eye yesterday ; it had been irritated by the reflection of the sun and the snow ; I applied a small disc of cocaine to it, and to-day it is better.

Both men and dogs are very weary, but I hope, nevertheless, to reach to-morrow the place where I encamped on the 21st, although it is still very far.

Friday, April 27th.—The sky is still overcast, and the temperature -30° .

We start at eight, and do not stop till half-past one, when we take some coffee kept over from this morning ; we then set out again immediately. At four we begin to cross the "Lake of Como," and at six encamp on the spot where we were on the evening of the 21st—that is to say, at $85^{\circ} 41'$ N lat. We are decidedly rivalling not only Nansen, but also Wrangell, who was celebrated for the rapidity of his marches.

We are able to accomplish these remarkable stages now, partly because we have only four sledges, and partly on account of the tracks, which Messicano, the leading dog, was able to follow again to-day, even where they had been almost entirely effaced by the wind. It is a small white dog, with thick hair and large, very intelligent eyes ; it is so called on account of the abundance of hair which fringes its legs, resembling trousers which widen at the feet. Ever since our departure from Teplitz Bay, it has held

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the first place of the first sledge, because it followed the man at the head of the convoy better than the others, and followed him attentively from the outset, being most obedient to the word of command. Although not so strong as its companions, it always pulls, and falls upon the dogs of the other sledges which, on arriving at our camping place, try to pass it. One would say that it feels all the importance of its position, and is proud of it.

Since we began our return, the guide to whom is allotted the first sledge walks behind it, letting the dog follow the track ; and Messicano gallops like a *drasky* horse, with its nose always down upon the snow. Sometimes it loses the track, and then goes more slowly and turns round as if to ask the man's help ; the man scolds it, and Messicano shows its anxiety in a truly comical way. It whines, and runs up and down with its tongue out, until it finds the track again, when it darts off in the right direction, and often keeps it for long stretches, where it would be utterly impossible for us to see a trace of our former passage. And this precious faculty of Messicano's is all the more remarkable since these dogs have very slight capacity for smelling.

By following the track we naturally gain the time which used to be spent in examining the ice before us, and making a way over it ; a man can also walk behind the sledge and help it if necessary ; and when the dogs perceive that there is some one near them, they pull with all their strength. These are several important advantages, and as we are in dread of being deprived of them at any moment by bad weather, we continue to drive the poor weary dogs forward. Many of them are affected since yesterday with severe intestinal disorders, but I consider that we shall lose the track before very long, when we shall once more have to fight our way through the ridges, and then the dogs can

rest as much as they like. I, too, indeed, feel that I am worn out, but I place my trust in the strength of my constitution, make an effort to conquer my great fatigue, and hope that it will pass away.

This evening we are at less than four degrees from Teplitz Bay, now the paradise we strive to reach. Although the sky is often overcast, the weather seems inclined to remain fine, with a continual breeze from the north, and we make heavy bets as to the date of our arrival at the island. Canepa bets that it will be May 23rd, Petigax the 25th, adding that we must keep up our spirits till the end, and arrive at a date corresponding with that on which we began our return from the north. I select the 27th; Fenoillet, who is always more pessimistic, the 30th; but even I should be very well pleased if we arrived on that day, although at present everything is smiling on us.

Saturday, April 28th.—The day began rather badly; we set off at eight, and were almost immediately stopped by a former channel, which had opened again, and forced to go 1,000 yards to the east in order to cross it. Soon after, we find a long fissure in the ice-pack, with vertical sides and edges as sharp as if cleft by a gigantic hatchet. This very long rift runs from east to west, and we see beyond it, towards the west, two or three like it. We are obliged to go about 2,000 yards to the east before we are able to cross. These obstacles made us lose fully an hour, and, what was worse, we definitely lost our former track.

I direct our course between south-east and south-south-east by the compass,¹ for if our deviation when returning is nearly equal to that we made when going towards the north, I believe that by

¹ Or between south and south-south-east, calculated according to the true meridian.

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keeping such a general direction I shall sight the island when about ten miles to the east of Cape Fligely.

On account of the direction of the lines of equal magnetic variation, if we were too much to the east, the indications of the compass should send us more to the west, and *vice versa*.

The ice ahead of us is level, interspersed with blocks and hillocks; the snow is hard, and we go on well until three, stopping only for about forty minutes for our usual refreshment of coffee, which we find acceptable, in order to be able to keep up our marches. We are stopped by a pressure-ridge of new ice, stretching to a great length from east to west, and very high; we feel uneasy, as we fear we have already come to the end of our fine runs; but the ridge, luckily, is narrow, and at half-past three we have already got past it, and are again travelling over wide level expanses.

We only encamp at seven, after covering from twenty to twenty-one miles. We have, therefore, advanced a degree towards the south in four days; if this progress continued for three or four days longer, we should be almost safe from any surprise on the part of the ice-pack. Even Fenoillet, who is always the pessimist of our band, exclaimed, in his native dialect: "Quinze jours de bon tin e tri degri!" (Fifteen days of fine weather and three degrees!) In a word, we are all well satisfied, and this raises up my spirits, which my wretched physical condition had much cast down. To-day I was frequently obliged to be dragged along; my legs were weak and so heavy that I could not take five steps continuously; to-morrow I shall try to do without pemmican, which I believe to be, in my case, a strong purgative; but if I deprive myself of such a nutritious part of the ration, I fear that I shall not be able to continue these forced marches. Canepa, who is, however, in a very good state of health, is to-day overcome by

fatigue, and towards evening can hardly drag himself along. Only Petigax and Fenoillet feel strong and are ready to go on.

Sunday, April 29th.—At nine we are on the ice-pack, which still continues to be easy to travel over, and with the exception of a halt for lunch we only stop at four, on meeting a high pressure-ridge recently formed; again we feel great uneasiness, as we did yesterday, and to-day, also, we escape with nothing worse than alarm.



"ON A MAGNIFICENT EXPANSE OF LEVEL ICE, WHICH IS CRACKED
IN EVERY DIRECTION"

At a quarter-past four we are on the farther side, on a magnificent expanse of level ice, which is cracked in every direction, and moaning under the force of the pressure; many clefts are opening, and some, which are hardly apparent when the first sledge is passing over them, are already from four to seven inches wide when the fourth is crossing. We drive the dogs forward, and for about an hour we go on almost running, pressed closely against each other. At last, after passing beyond a second-ridge, we come upon firmer ice, which shows no signs of fissures, and does not creak like the other.

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Meanwhile the north-east wind is blowing more strongly ; but we still continue without our *anorakers*, the temperature seems so mild and soft. Before we set out the thermometer indicated -21° .

At five we cross a lake frozen for some few days, which has an almost perfectly circular form, with a diameter of a mile or a mile and a half. It is like an enormous cavity. Beyond it we come upon ice less recently formed, but not very old, among a regular labyrinth of small and very rugged ridges, which we are, however, able to easily pass without having to work with the pick-axe.

At six we are upon a tract of solid ice, and see to the south a wide belt of new ice, on which it will be better to risk ourselves to-morrow, as we could find no place there to encamp, and we pitch our tent. I feel better to-day ; I took no pemmican this morning, and Petigax, who served out the rations, generously gave me as compensation a more abundant share of coffee and milk. We have covered from fourteen to twenty-five miles, deducting from the total a couple of miles lost by the windings. I calculate that we are in $85^{\circ} 15' N.$ lat. Another day like this, and we need feel no more anxiety about our provisions.

Monday, April 30th.—The north-east wind blew with violence all last night and this morning ; we waited in our sleeping-bag until half-past eleven ; then yielding to the desire of marching in spite of the weather, which was still rather stormy, we take our breakfast and get the sledges ready.

These operations are now executed in about two hours, partly because there are fewer dogs and sledges, but chiefly because the temperature is mild ; yesterday an hour and three-quarters elapsed between the time we arose and our departure. Previously the pemmican was always waiting for the men ; now it is the other

way about, although I am able to cook more expeditiously, as I have had greater practice and the temperature is higher.

Yesterday and to-day I have had no dogs killed, nor shall I for some days longer, as I wish to keep up a rapid speed as long as the ice is favourable. We have thirty dogs, and a load which, including the weight of the sledges, does not amount to 1,543 lb. ; so that the dogs are not only those which have been specially selected, but have fully a third less of weight to drag than when they left Teplitz Bay. When we come again among the *séracs* I shall diminish their number, that we may not consume too much pemmican, and then suffer from want of it.

We set off at two and cross the fresh ice, which delayed us much on our way, as we had to change our course continually. At half-past three we can at last definitely take the direction of south-south-east, over very fine level expanses of old ice, separated from each other by barely indicated pressure-ridges, which we can cross without stopping the sledges. The dogs go wonderfully well, and do not make us lose a single minute ; the snow is very hard, and in some places not even marked by the runners.

At half-past seven we reach a very large frozen lake. When we are near the middle, the thin ice yields under the sledges and we hastily gain the shore nearest to us, that on our left, pursued by the dread of sinking, until we have reached the old ice-pack. We proceed on this for another half-hour, and then, after we have passed some ridges, a long arm of the lake stops our way.

We encamp, sheltering ourselves as much as we can from the north-east wind, which still blows very strongly ; it is nine o'clock, and we are fully eleven miles farther to the south than this morning, and very near the 85th degree of latitude. I am exceedingly pleased at this, but to the guides it seems quite natural to have travelled ninety

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miles in six days ! Now, if we do seven miles daily, we should reach the island on May 30th, and the guides are almost certain that, if the weather is not bad, they can accomplish, on an average, this distance each day, even if we should meet with *séracs*, or ridges, with which they now feel quite familiar ; the only obstacles they fear are channels and water. It would be enough for me to reach the hut in the first week in June, and I should still consider that I had made a splendid march !

Tuesday, May 1st.—The north-east wind blew so strongly last night that we feared much for the tent ; and this morning we had just taken our breakfast and harnessed the dogs when the wind became still more violent, and raised such a snowdrift that we were obliged to put off our departure. At noon the wind fell, and the thought of being put on half rations if we did not work impelled us to set out.

The day had begun badly, and it became worse as it went on ; the arm of the lake is very difficult to cross, and then through ridges, *séracs*, and a very bad surface we lose much time. At half-past one we are able to march more steadily, over an old ice-field, which is tolerably level, but we are stopped for half an hour by two ridges and a channel. These brief halts cause great hardships to ourselves and the dogs, on account of the violence of the snowdrift, which annoys us much more when we are standing still than when we are walking with our face towards the south. We go on hastily and without resting, and are aided by the ice, which is level, and in some places almost free from snow.

When we encamp in the evening it is difficult to find a shelter from the wind, without which it would be impossible to pitch our tent. The ice-pack is level, with here and there a few slight eminences, which are not sufficiently marked to protect us. At last,



THE PACK IN MAY

about seven, we meet a small hillock on our way, a poor defence against the horrible wind which is blowing. We soon realise that we are very badly off; but we must have patience. This evening we have not only earned the full ration, on account of the twelve miles which we have travelled towards the south, but also a spoonful of rum, which some days ago I promised in honour of the crossing of the 85th parallel of latitude; and the discomforts of our camp seem mere trifles in view of such a pleasure.

Since we left the camp in the far north, I have not been able to take an observation—in the first two days because I had not the time, and did not think it necessary, and then, because the sun was not seen again at an hour suitable for taking observations for latitude or longitude. Now I am impatient to know exactly how far we have come down to the south, and if this continual north-east wind, which has blown so strongly for three days, has driven us a little in that direction. It would be a just compensation for the cruel jokes played on us during the first few days.

Fenoillet, who has been named the mechanician of the expedition, arranges a support for the cooking-stove, which has gone very much to the bad; it is light, certainly, but it is too liable to get out of order, and it will be a miracle if it lasts till our return. When will that be? We hope more than ever that it may be before the end of the month. In the meantime, Fenoillet has predicted that we shall cross the 84th degree within six days—"Si fe bon tin" (If it is fine), it is well understood.

My right hand has pained me for several days, and since yesterday my whole arm has caused me suffering. It did not let me sleep last night, and I perceive that the axillary glands are also inflamed.

Wednesday, May 2nd.—We are blockaded by the bad weather;

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we have snowdrift, darkness, and a strong gale from the north-east, which towards evening shifts to the north. I unbandage my finger; it is swollen almost as large as the wrist, and the end, which was frost-bitten, is black. I clear away all the black part with a lancet, which I hold in my left hand. As soon as I introduce the point of the blade into the flesh, an incredible quantity of matter issues forth, which gives me great relief. I take away a covering of dead flesh, and there remains sticking out of the sound a piece of bone, which has all the appearance of being dead. When I press the end, I feel a great pain in my whole arm. I consider that, if I leave this useless projection, the smallest blow will cause me intense suffering, and I therefore set about cutting it off; but I have only scissors, and the little bone is very hard, so that I suffer a great deal while taking a piece off. Over this little operation, which a doctor would have performed in three minutes, I passed fully two hours, to the great discomfort of my companions, who had to be present and help me. Canepa at one time could stand it no longer, and fled from the tent, in spite of the wind and snow.

The temperature varies between -12° and -16° .

Thursday, May 3rd.—We are still blockaded for the whole morning. Towards half-past ten the wind falls somewhat, and very much lessens the snowdrift and the darkness. It takes us four hours to dig out the sledges, especially that which carries the *kayak*, which is buried under three feet of snow. The snow, indeed, is so deep that the top of the tent hardly rises above it. It would certainly have given way under the weight if we had not gone out several times, by day and by night, to clear away the snow around it. Shortly after 3 p.m. we are on the march over very good snow well beaten down by the wind, and the dogs are

pulling very willingly, although they have been on half rations. We have some difficulty in keeping up with them, and it tires us very much, as we continually sink into the snow.

We cross many belts of new ice, not very extensive, and several very recent lines of pressure. This makes us hope still more, that the ice-pack has been driven to the south by the north winds, which have been blowing with more or less strength for over twelve days. We go on well until 11.30 p.m., when we meet with some old ice, intersected by many channels, and encamp. I calculate that we have travelled about eighteen miles in the right direction. The men are rather tired. My right arm gives me much pain, but I do not mention it to my companions, as it seems to me that yesterday's operation rather upset them.

Friday, May 4th.—We cannot leave in the forenoon, as with the darkness which prevails it is not advisable to go into the midst of the channels we saw yesterday evening. I take advantage of it to dress my finger, which seems better; since the operation certainly the axillary glands have caused me no more pain, which was what gave me most anxiety.

The wind shifts to the north-west, and though it raises much snowdrift, it dispels the darkness somewhat, and we start at 2 p.m. We lose some time in crossing the nearest belt of channels, but then find the ice-pack in excellent condition, and march across it easily. Petigax and Fenoillet, who take it in turn to lead the convoy, seem to vie with each other in lengthening their steps.

At the beginning of the march, while we were following a channel running from north to south, the dogs of the first sledge must have seen a walrus or seal, for they suddenly dart off like

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arrows towards the channel, barking furiously. They upset the sledge, break the trace, and do not stop till they are in the water. We have great difficulty in holding back the other dogs, and lose about twenty minutes in putting the convoy once again in order. During this time, though we looked about carefully, we could see no trace of any living animal. At half-past nine the wind becomes stronger and raises much snowdrift; we encamp with but slight shelter, as this level tract presents only some isolated hummocks. We have covered from thirteen to fourteen miles.

Saturday, May 5th.—Last night and this morning there was again a very strong wind. At eight it seemed to subside, but it set in later with greater violence, and we were not able to harness the dogs till noon. At half-past one we resume our march across the level, over which are scattered small hillocks, and afterwards meet with isolated blocks of ice of all sizes and with such strange shapes that for a moment it seemed to me as if we were passing through the cemetery at Staglieno.

The snow is hard, the dogs do not tire, and we are on the sledges, which are preceded by one of the guides, who, as yesterday, take very long steps to make up for the short rest which they take on the sledge from time to time. Canepa's sledge, with a *kayak* in addition and over 110 lb. of pemmican, has only six dogs, but goes on as well as the others, which have seven or eight.

We cross a recently frozen channel, over 500 yards wide, stretching from west-north-west to east-south-east as far as the eye can see. In the middle there is the usual fissure, which we can easily cross, thanks to the pressure, which makes the thin crust of ice creak under our feet.

At four, after passing a line of embankments, we again perceive an immense level expanse. As far as the horizon, not a

block of ice, not the slightest swelling can be seen; it is a smooth plain like a calm sea. We feel puzzled and astounded, and ask if we have not gone to the north instead of going to the south? And to-day we feared that we should be among *séracs*! Only at half-past six do we begin to see some blocks of ice and slight lines of pressure.

Although the temperature is between -15° and -17° , the wind, which has shifted round to west-north-west, blows strongly and makes us feel very cold. At half-past eight the dogs are tired on account of their rapid pace, and as we have met with a small hillock, which affords good protection, we encamp, since the level track ahead of us shows no other shelter. To-morrow is Sunday, and I have resolved to take a half-day's rest, and also to mend a sledge and settle all the loads again. We should not, therefore, be too much exposed to the wind, which gave so much annoyance during our two last encampments.

To-day we have retired twelve miles more to the south, and are now half-way back to the hut. If we go on thus, we shall make a splendid return journey, and I shall perhaps succeed in saving half my finger.

This evening, after the inevitable calculation of our mileage, we were talking of our coffee and milk, the half ration of which (for we always keep some for lunch) seems to us more delicious than what we had at the hut, and this conversation about coffee and milk is repeated every day. Petigax and Fenoillet confess to me that, for the first time in their lives, they often think of the fresh cheese of Courmayeur and of a thousand acts of gluttony. It was a consolation for me, who had thought that I alone had sinned in desire, and who used to feel much ashamed when I found my mind fancifully longing for coffee and milk, the sweet, light

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pastry and the *mille foglie* of our cook Gini, the large fresh rolls of Milan—in a word, for a thousand pleasures of the palate which had previously never caused me the slightest temptation.

And only now do I understand why Nansen often speaks of the dainties which he contrived to make, and of his gastronomic dreams!

This evening we held a council to choose the dog that was to be killed. Alleato, a good strong dog, was condemned. We do not know which to select now, for the twenty-eight which remain pull very well, and are all fat, except Messicano and Pecorella, a dog of the same type as Messicano, and also very good at taking the lead.

Sunday, May 6th.—We have unbound all the sledges, cleaned out the snow from the interior of the *kayaks*, and repacked the loads, distributing them as equally as possible. We still harness eight dogs to the first sledge (that which makes the track), and seven or six to the others.

We now feel the daily diminution of the dogs, and the reduction of the load does not correspond with it, for when full rations are given to all, the daily consumption does not amount to forty-four pounds.

The wind shifts slowly to the west, then to the south, and after mid-day the weather becomes as bad as on previous days. I decide on observing a complete holiday on account of the long journey we have already made, and my companions are very well pleased. We are all tired, and a day of rest will do ourselves and the dogs much good.

We have now only twenty-eight dogs, as Nansen had on the day he left the *Fram*, but the state of ours is very much better; they are well picked, as we were able to select them from a large

number, and their loads now come to less than fifty pounds each, while Nansen's had to drag about fifty-seven pounds on starting. This reflection allows us to entertain favourable hopes for the remainder of our journey.

I recommence my calculations, made on April 25th, and perceive that I have made a mistake of a mile too little; we have reached $86^{\circ} 33'$ N. lat., and are much rejoiced.



"WE HELD A COUNCIL TO CHOOSE THE DOG"

After putting the sets of harness in order, we mend the *fnskos* which can still be used. We make up five pairs, which are still good, besides those we are wearing. These are more than we want, as we must soon replace them by the *kömagers*. We dine with half rations, and after our Sunday prayer get into the sleeping-bag. The wind has shifted to the east, and the thermometer has fallen from -13 to -17 .

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Monday, May 7th.—There is a breeze from the east, and the air is dark. We are on the march before eight o'clock, and are soon at the end of the level expanse we saw before us yesterday evening. We cross a narrow channel, and find a belt of ice which must have been broken up a few weeks ago. There are small pressure-ridges in every direction, and a succession of large pools newly frozen over, the saline efflorescence on which forces our dogs to let their tongues hang out ; but we go on very well ; the snow on these belts is very hard ; it was made wet by the fog of these last days, and had frozen. At eleven we are on a field of old ice, a vast and level expanse like those we met on our marches from the 21st to the 24th of last month. We ask each other, if it is possible that we are so near the 84th degree, where we had found such obstacles to our advance when marching towards the north ?

It is a cloudy day, and only about three is a ray of sunshine seen, which soon disappears. We lunch at one, and then go on, almost always sitting on the sledges. We cross three very wide frozen channels. One has a fissure in the middle a little less in width than the length of a sledge, and we get over by making the dogs jump it, for now they are less afraid of water, and very obedient. Canepa and I, who are last, are forced to employ a sledge as a bridge, in order to avoid a bath.

We get over the obstacles presented by the channels with remarkable quickness now. I do not know if this comes from their being more easy to cross, or because we are more skilled in finding out at once the point where they can be passed. We spent to-day less than three-quarters of an hour altogether in crossing four, one of which was very broad and showed a great deal of water. When we meet a channel the guides walk along the edge, one going towards the east and the other towards the west. Canepa and I

remain standing with the sledges, and join the first who signals that he has found a crossing.

Towards evening the wind shifts again to the north and freshens. We encamp at seven, under the shelter of three great blocks of ice, very well satisfied with our day's work, which has brought us about twenty miles nearer to the south. We must now begin to open the boxes containing the preserved meat, hitherto kept wrapped up in paper. To do this is very troublesome, as it is still frozen and the ice-axe has to be employed.

Tuesday, May 8th.—We have at last taken an observation for the latitude. And what a latitude! Fifteen miles farther to the south than we thought. During the night there was a north wind, which fell towards 7 a.m., and the sky is still overcast. We set out at eight, and though we worked without ceasing up to half-past eleven, we have done only four or five miles towards the south-south-west. It is impossible to go to the south-east because of the number of channels visible in that direction. We are all in very bad humour.

A little before noon the sun feebly shines out, and remains visible. I send Petigax and Fenoillet forward with a sledge, and stop to take a meridian altitude. I calculate from memory, and it seems to me that I must have made a mistake in reading the degrees. I unfasten the sledge again, take out the sextant, and verify the altitude. It is really $23^{\circ} 8'$, which gives the latitude of $83^{\circ} 40' .^1$ Moreover, as the edge of the sun was not distinct, I took the altitude at much less than the true figure, in order to avoid any disillusion.² I also note the variation of the compass, which I find to be about 16° east.

¹ $83^{\circ} 42' 54''$.

² In fact, according to the meridian observation taken on the 10th, the latitude at noon on the 8th must have been much more to the south.

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We tie up the sledge, and hasten away on the track of Petigax and Fenoillet, whom I overtake three-quarters of an hour later, occupied in making a way over a wide channel opened between two pressure-ridges. When everything is ready, and we are about to cross, the two ridges move away, and the work done by the guides is spoilt.

We take our coffee while waiting for the ice to cease moving, and in spite of the obstacles met to-day, we are delighted at the good news. We hoped, indeed, that the north wind would have carried us down somewhat towards the south, but never expected to gain a quarter of a degree.

The temperature is at 0° . When our lunch is ended the ice seems fixed, and we build a bridge over the channel for the second time. But it widens out again rather quickly (three feet every two minutes) and we remain confounded. We then follow the bank, which runs between south and south-south-west, and at three o'clock, by taking advantage of a favourable pressure which narrows it, at last succeed in crossing the channel. We are now in a belt of new ice, extending about two miles, covered with water and snow, a regular snowy marsh; and we must cross it for an hour, through a labyrinth of channels going in every direction. At four we are once more upon old and level ice, on which we travel very well for two hours more. Then, again, another wide channel running from north-north-east to south-south-west. We march along it in the latter direction until seven, but without being able to cross.

The sky is again overcast, and the wind, shifting to the north-east, blows freshly, raising much snowdrift. We encamp under the shelter of two hills of snow which give very little protection. Since noon we have covered five or six miles in

latitude; but we are so pleased to know we are so very much nearer to the south, that the shortness of our march does not drive away our good humour. From this moment we feel that we can live free of anxiety, as we are certain of having provisions enough, and of returning happily to the hut; and I am best



"THERE IS WATER ON ALL SIDES"

pleased of all, because I shall have the great satisfaction of bringing my men back to Teplitz Bay without having subjected them to any privation.

Wednesday, May 9th.—Last night there was a strong north-east wind. We set off at seven in the midst of a snowdrift; the sky is still overcast, the air is foggy, and the pale light does

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not allow us to see where we put our feet. The channel which we followed yesterday is now closed up, and in its place rises a pressure-ridge, through which we must make a way. Beyond is a wilderness of channels, of great and little lakes, and ice still new and weak ; there is water on all sides ; it is enough to make us despair.

At half-past twelve the wind and the snowdrift are stronger than ever, and we pitch the tent for our luncheon. We feel somewhat dejected ; yesterday, when we found a latitude for which we had not hoped, our minds felt inclined to the highest optimism, but to-day we are again very anxious. Fenoillet, who is always the most pessimistic, is convinced that we shall have the same ice we have met to-day as far as the island. If that were the case, a month would certainly not be too much in which to reach it. This morning, after five hours' continuous toil, we have advanced only a little more than five miles, but we met two large tracks of new ice, without which we should have done only a couple at most.

At half-past one we set out again in somewhat clearer weather. Pressure-ridges and channels follow each other for another half-hour, and then, after a small belt of new ice, on which we continue to thoroughly soak our *fnskos*, we reach an old ice-pack, level and smooth, with very hard snow : it is an ice-pack like those of the 86th degree, as we say, and better still. From the smiling faces of the men, it is easy to understand that their minds feel relieved from the incubus of the channels. We make a quick run, sitting almost always on the sledges, until half-past six. The sun came out at four o'clock and the sky is gradually clearing, although the same wind continues which has usually brought an overcast sky and darkness. As soon as the sledges stop, I

observe the altitude of the sun for the calculation of the horary angle. The sun is not clearly defined, and I shall have only an approximate longitude, but it will be better than uncertainty.

We are now upon ice almost free from snow, and it takes some trouble to find two square yards of soft snow on which to pitch the tent. We have ended to-day by travelling fifteen miles in the right direction, ten of which have been got over only after mid-day.

Thursday, May 10th.—Last night, while the men were asleep, I calculated the longitude, and the result was 50° east of Greenwich¹—that is to say, we have drifted eight degrees of longitude to the west of Teplitz Bay, which in this latitude correspond to about fifty-six or fifty-seven geographical miles. It is a very serious deviation, but if we at once change our course towards the east, it will increase our journey to the island by about twenty-five miles—a couple of days' additional marching!

When we set out this morning, at half-past seven, I tell Petigax to guide us between east-south-east and south-east, according to the compass. As the surface of the ice is almost bare of snow we can keep up a rapid pace. We meet more channels, which are, however, easily crossed, as they are for the most part frozen; they run from north-east to south-west, and they must have been produced by the north-west winds of last week. On the other hand, those which we met the day before yesterday, which mostly ran from north-west to south-east, must have been opened by the north-east wind; and, indeed, they seemed to have been recently formed, and were much more difficult to cross.

At noon I stop to take the meridian altitude, and the men are agreeably surprised to hear that we are in $83^{\circ} 5' \text{ N. lat.}$ ²

¹ 3 h. 19 m. 58 s. east of Greenwich.

² $83^{\circ} 5' 25'' \text{ N. lat.}$

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I partly expected it, because I am now convinced that the ice-pack is always moving towards the south, and that it will not stop until the north winds cease, and the south winds have blown for some days, and also on account of the insufficient latitude which I took the day before yesterday, so as not to err through optimism. Then the sun was dim, and the horizon indistinct; to-day the sky is perfectly clear and the altitude excellent. I have also verified the variation of the compass, which I find to be between 15° and 18° east. While we are taking our pemmican and tea (we breakfasted this morning only with coffee and milk) we only talk about miles and days and the hut, and this with an unusual amount of excitement. At one we are again on our way, and go at a breakneck pace until six o'clock, all of us on the sledges, the guides taking the lead by turns.

We have travelled to-day not less than twenty-one or twenty-two miles, about twenty after noon. We lose, unfortunately, a certain portion on account of the deviation of our route from the direct line. As soon as we stop to encamp I take the altitude of the sun. At two o'clock the wind shifted from north-east to north, and it raises up a slight snowdrift.

Friday, May 11th.—The result of the calculation of yesterday evening's longitude¹ gives me a deviation towards the west of almost a degree of longitude and does not really correspond with the distance we have travelled almost due south-east. The result of another observation, taken this morning, places me still more to the west,² but the observation was not very exact. We shall see if, as I believe, the ice-pack will continue to move towards the south; that would be very natural, as it is driven by the north wind, which blew very strongly last night, and is blowing vigorously still.

¹ 3 h. 16 m. 27 s. east of Greenwich. ² 3 h. 13 m. 54 s. east of Greenwich.

The pot was boiling this morning at five, and at seven we were on our way across a level stretch of snow well beaten down. It is no longer a feverish desire for marching, but a delirium which has seized our guides. They go with long strides, which they keep up, I know not how, for hours. I let them do as they like, for, after all, the quicker we travel the sooner we shall arrive; in the evening they are worn out with fatigue, but do



"A PLAIN AS BARE AS A DESERT, WHICH SEEMS TO BE QUITE CIRCULAR"

not like to confess it. With the last spoonful of soup they begin to doze; when they have had their tea, one falls asleep, and the other leaves the tent, lest he should do the same; and as soon as the bag is spread out, they are both fast asleep. Canepa and I are much less tired, for as we do not lead the covvoy we naturally make more use of the sledges than they do.

Yesterday the monotony of the level expanse was varied by

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many small blocks of ice, the angles of which had been rounded off by the wind ; to-day, on the contrary, we have a plain as bare as a desert, which seems to be quite circular, and bounded on the horizon by *séracs*, which we never reach, because they do not exist ; they are merely pressure-ridges which at a distance stand out one beyond the other.

We went on until a quarter to twelve without check, stopping only three times for a few minutes, during which the guides changed and rectified the direction of the convoy. Judging by the observation taken for latitude,¹ I believe that the ice-pack has come down still more towards the south, and rather quickly, although the guides think that they have certainly travelled more than twenty miles from noon yesterday up to noon to-day ; if that were the case the drift would have been very slight.

We set off again before one, and go at a good rate till six, meeting with four channels, which, however, do not make us lose much time. The guides swear that we have done more than eleven miles since mid-day ; by my usual mode of reckoning, I should say ten. We shall see to-morrow. As soon as the sledges stop I take a meridian altitude. The sky is bright and unclouded. There is still a fresh wind from the north ; it blew very strongly to-day. The temperature is -12° .

Saturday, May 12th.—The observation for longitude taken yesterday gives as a result $48^{\circ} 40'.$ ² I awoke last night, made all the calculations over again, and have no doubt about them. If our chronometers are going well, the pack must have moved, and continues to move, towards west-south-west. That is strange, because yesterday the wind blew very strongly from the north, as

¹ $82^{\circ} 47' 18''$ N. lat.

² 3 h. 14 m. 42 s. east of Greenwich.

it has done for several days. At any rate, it is a matter which causes me much anxiety. If it is merely the action of the wind which has made the ice-pack drift, when the wind falls the ice will stop, and then all will be well ; but if it is drifting from east to west under the influence of some strong current existing in these latitudes, we shall have a good deal to do to reach the 58th meridian, seeing that in two days we have been dragged from ten to twelve miles towards the west.

If, on the other hand, on account of the great diminution of the cold, the chronometers are going more slowly, I should have found a wrong longitude, much more to the west than my true position, which might still be in the direction of the island. In that supposition it would be advisable not to direct my route towards the east until I am on the parallel of Cape Fligely, as otherwise I might run the risk of going beyond the meridian without seeing land and so of losing myself. I resolve, therefore, to go on towards the south-east, in which direction, even if the chronometers were much in error, I might pass to the east of Prince Rudolph Island, but at a distance that would allow me to perceive it distinctly, and on reaching the 82nd degree of latitude, to turn due east, even if I should not as yet have sighted land.

The weather has become bad, and the fog does not allow us to see 300 yards before us. We rose, in spite of that, at five, and at a quarter to seven we shout out to our dogs the usual "Go on, *brrr*." The snow was exceedingly good, hard, and smooth, easy for the dogs' claws to lay hold of without hurting or tiring their paws, and it receives hardly any imprint from the passing of the sledges, on which we are comfortably seated. The ice is level ; but here and there some large block breaks the monotonous whiteness, the pallid repetition of which exercises a stupefying effect.

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The fog clears away, and on the horizon we see on the grey sky—from north-east to the east, the south and the south-west—a broad dark stripe which seems to denote open water. Later this stripe extends also to the north, and changes its rotundity and intensity, where previously it had been sharply marked. That makes us hope that it is a peculiar effect of light produced merely by the reflection of unfrozen channels, as in fact we discovered in the afternoon.

At half-past eleven we are stopped by a channel about a hundred yards broad, trending from east to west and stretching as far as the eye can reach. We take our pemmican and tea, and at one o'clock go along the bank towards the east. We see four seals rise out of the water for a few moments, and two little auks fly over our heads. The sight gives us much pleasure; it is a return to life! The dogs bark furiously at the first animals met with since we left the island.

The channel obliges us later to trend for half an hour towards the north-east, and then a beneficent pressure allows us to cross the part not yet frozen, where it was still about forty yards wide, and we find a splendid expanse of flat ice, over which we go very well for half an hour, once more sitting on the sledges. Then we have a regular struggle with broad channels winding in every direction and difficult to cross. We go a little to the east, a little to the south, trying not to go in a direction away from our goal.

At a quarter to five, after passing a pressure-ridge which bounded that belt of difficult channels, we have again before our eyes a vast level tract stretching away to the horizon without a break. We are all struck by it. Where, then, was this splendid ice-field when we were painfully making our way towards the north, advancing a few steps at a time, as we might when climbing

a high mountain? We are not far from the 82nd degree of latitude. We have met with channels, pressure-ridges, and isolated *séracs*; we have seen belts (which are easily avoided) of new ice, broken up, and bristling with pinnacles, but since we began our return it has not yet been given to us to see one of those terrible lines of *séracs* which made the first stages of our voyage up to March 27th or 28th, and nearly on the 83rd parallel, so fatiguing. Then we saw them on all sides, to the east as well as to the west; now those terrible enemies have disappeared. The difference between the ice-pack in March and that of the present time is remarkable; one might say they were the product of two absolutely different seas, and the ice-pack which we found to the north of the 85th degree might well be typically placed between the two preceding.

As to-morrow we shall have a rest, of which both men and dogs are very much in want, we go on until seven. To-day it is very difficult to estimate with an accurate amount of approximation how much we have travelled, but I believe that we have advanced more than twenty miles on our way. The longitude observed this evening¹ shows that we have gained more than a degree to the east since yesterday evening. I fear that we shall have lost it again by Monday. The wind now blows very freshly from the north, almost from the north-north-west. If it continues to shift to north-west, we shall have clear weather. The temperature is -11° .

Sunday, May 13th.—Yesterday evening we went to sleep at half-past nine, and the men awoke this morning at half-past nine. A fine expanse of water, about 300 or 400 yards broad, has been opened about fifty yards from our tent, and a seal has shown itself several times on the surface of the water. The rapidity

¹ 3 h. 17 m. 26 s. east of Greenwich.

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with which these animals reach the pools of water which are frequently opened at a great distance from each other, and almost always without any apparent communication between them, is extraordinary. I have sometimes seen one or more seals show their noses out of an isolated pool a few minutes after its formation. There is something wonderful in it.

After breakfast I make a careful inspection of our provisions. We have still full rations for seventeen days, and three-quarters of a ration for twenty-three days. We have only, however, forty-five rations of biscuit. For the dogs we have still 440 lb. of pemmican (200 rations), and besides this we have 83 lb. of finer pemmican, which had been taken at first for the dogs, but which it will be well to keep for ourselves. I have already begun to take a couple of pounds to replace the food which I keep back every time the men get a reduced ration. After the very long marches of the last few days, our appetites were very great, and the full ration was hardly enough. We are, however, about eighty miles from the island, and no matter how slow our progress may be, we shall reach it before the end of two weeks.¹

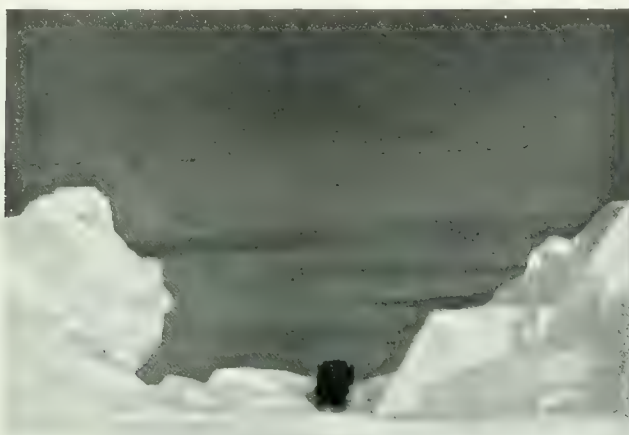
We resolve that as soon as we shall touch land we will put all the coffee and milk which may be still remaining into the pot, and make a first-rate cup, so as not to look as though we were starving when we reach the hut.

We clean our rifles and mend the *finskos* and damaged sets of harness; then, while Petigax sleeps and the other two men who are sitting at the bottom of the tent wait patiently for the dinner hour, I dress my finger, which is again swollen with matter. I ought to dress it more frequently, but have not the

¹ At that time an average of five miles a day seemed to us incredibly small.

time, and, moreover, have a particular scruple about burning our petroleum to procure the water required for the purpose. I hope to be soon able to put myself into the hands of the "Professor," as we usually call Dr. Cavalli.

At half-past six we are in the sleeping-bag, but it is impossible to sleep; at half-past seven a ray of sunshine appears, and I rush out of the tent to take an altitude. We have not drifted



"IT IS A MODE OF ADVANCING WHICH GREATLY EXHAUSTS OUR STRENGTH"

towards the west.¹ We must certainly, however, have come down to the south, but I cannot tell how much, as for forty-eight hours I have not observed the latitude. A north-easterly breeze has risen during the afternoon, and the ice is now beginning to press from all sides. Fissures and channels are opening in every direction in the ice on which we are encamped. The dogs are excited and give much annoyance; they snarl and bark, especially when a seal rises out of the water of the neighbouring lake, as

¹ 3 h. 17 m. 37 s. east of Greenwich.

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if on purpose to irritate them. At half-past ten we can stand it no longer, and all too readily entertain the idea of setting out; the order to get up is therefore received with signs of joy, and at half-past eleven we are on our way. At midnight I succeed in taking a meridian altitude.¹

Monday, May 14th.—We go on well until 5.30 a.m., crossing four channels without difficulty, and covering about fourteen or fifteen miles to the south-east. We are then stopped by a broad pool of water not sufficiently frozen to bear the sledges; we breakfast, and I am able to take the altitude of the sun.² We set off again at a quarter-past six. In order to turn the thin ice we are forced to enter a belt of very difficult *séracs*, the snow between which is so deep and soft that we often sink up to our waists in it. It is a way of advancing which greatly exhausts our strength, and we encamp at half-past nine, worn out by fatigue, after having travelled three or four miles at most since breakfast.

This morning we were so warm that we perspired even when standing still; at eleven, after taking a light soup, we get into the sleeping-bag, where we sleep with half our bodies outside, without even making use of the little bags which serve as pillows. The temperature is -7° . At mid-day I take a tolerably exact meridian altitude,³ and in the evening am able to take an excellent observation of the horary angle, which gives me for longitude $50^{\circ} 15'$,⁴ and we are in $82^{\circ} 34'$ N. lat. I shall go on thus for a few days more, and then, if I find that I cannot overcome this drift, I shall push on resolutely to the south, as far, if necessary, as $81^{\circ} 30'$, in order to take shelter among the islands, as I am convinced that the powerful current which causes me so much anxiety exercises no

¹ $82^{\circ} 30' 13''$ N. lat.

² 3 h. 17 m. 32 s. east of Greenwich.

³ $82^{\circ} 33' 28''$ N. lat.

⁴ 3 h. 21 m. 6 s. east of Greenwich.

influence in the extent of sea comprised between them and the line which joins Cape Fligely with the western extremity of Alexandra Land. In this case we shall have to reascend towards the north along the land, which will lengthen our journey very much, but I do not see any means of escaping.

The two latitudes observed at midnight and at mid-day differ strangely and in a contrary sense from my estimate; the midnight altitude was, moreover, much below the truth, for at that hour the sun was indistinct and the horizon dark. Besides this, the directions in which we march are now more approximate than ever; it is impossible to follow one continuously, and it is also difficult to keep an exact account of all the windings and deviations which broken ice or channels oblige us to make; the consequence is that it is easy to be mistaken in estimating the length of the way.

At 7 p.m. we renew our struggle with the continuation of the *séracs* met this morning, and advance with difficulty, making nearly all our way with the ice-axes. In more than two hours we have only gained two miles towards the east-south-east. At half-past nine we get away from this horrible tract, one of the worst we had met. The ice is better, and the snow offers a little more resistance, whilst small level spaces and passages between the *séracs* enable us to march for fully a quarter of an hour at a time without stopping. In comparison with the first part of our march, we seem now to go on very well, but at midnight we are not more than five miles from to-day's encampment. We have seen recent tracks of bears—imprints which may date from two or three days back.

Tuesday, May 15th.—We encamped at 5 a.m. very much fatigued. After midnight we crossed more *séracs* with snow, which gave us much trouble; and then a large expanse of level

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ice and several smaller, making altogether an advance of five or six miles, with which we are rather pleased.

It seems to me that I see to the south-east a shadowy form resembling the island, but the calculation made this morning gives me a discouraging result.¹ Unless the chronometers have varied, it is impossible that we should see the land. The men are asleep, but I cannot close my eyes, as I am a prey to an anxiety which becomes every day more painful.

The weather has become bad; there is a cold wind from the north-east, the sky is overcast and the air foggy. At 5 p.m. we start again, and cross rugged *séracs* varied by a few small level tracts. I calculate that we do on an average a mile an hour. At eleven we stop to eat our pemmican. The wind has shifted to the east, the air becomes clear, and the sun shines out brilliantly to the north.

Wednesday, May 16th.—As soon as I have taken the meridian altitude of the midnight sun, which gives me for latitude $82^{\circ} 18'$,² we resume our march. We find a series of expanses of level ice which make Petigax shout, "The ice-pack of the 84^{th} degree." But later on, at half-past four, we are on the banks of a broad, winding channel, which goes from east-north-east to west-south-west, and forms lakes and a whole network of channels and lanes.

We are forced to direct our course for about an hour towards the east, and then towards the east-south-east, and succeed at last in crossing the channel, but there are others still before us. It is past six when we encamp, tired to death after thirteen hours of a most fatiguing march. I take an observation of the altitude of

¹ 3 h. 21 m. 49 s. east of Greenwich.

² $82^{\circ} 18' 22''$ N. lat.

the sun. We have again fallen away to the west.¹ At noon the latitude is $82^{\circ} 17'$.² Is this horrid current now carrying us away, perhaps in a straight line towards the west?

From 6 till 11 p.m. we again travel up and down to the north-east, to the south, and to the east-south-east, in the midst of a network of ridges which had risen up quite recently, as though to render our advance still more difficult and complicated. And now we are caught by a great channel in the shape of a horseshoe, the spreading arms of which trend, one to the south-west and one to the north-west. I stop the convoy and serve out some pemmican, hoping that in the interval a pressure will save me the trouble of returning on my steps. With the temperature at -10° we can no longer reckon on the water freezing.

The air is again foggy, the wind blows from the north-west, and it is snowing.

Thursday, May 17th.—We set out again at midnight; we succeeded in crossing the channel a mile to the north-west, and then we struggle with *séracs* and other channels.

At 2.30 a.m. we find it impossible to go any farther; we are in the angle formed by a wide channel which on one side goes towards the north, and on the other towards the south-west. After trying in vain for an hour to cross it, I order the tent to be pitched. It is 3 a.m., and there is time to go to the north and the south-west. While we are resting, a movement of the ice may perhaps take place.

At noon the sun is bright, and I am able to take a good observation; we are at $82^{\circ} 15'$,³ only two miles more to the south

¹ 3 h. 18 m. 50 s. east of Greenwich.

² $82^{\circ} 16' 40''$ N. lat.

³ $82^{\circ} 14' 31''$ N. lat.

than yesterday, but who can tell how much we may have drifted again to the west, on account of this continual north-east wind? We have still biscuits for nine days; they are the most liked of all our provisions, and I am certain that it will be a great privation to have no more of them. One biscuit apiece is now served out every morning and one every evening—or, rather, what is nearly the equivalent of a biscuit, for they are broken up in the box and reduced into small fragments. It seems to me that to diminish this part of the ration still more would be equivalent to suppressing it, and I should not like to increase the anxiety which the men are already feeling on account of this hateful drift.

I hope to reach the island within ten days; a favourable succession of level expanses and some wind from the north-west would be enough. Even if we had to pass another month on this ice-pack, we could manage to struggle against hunger; our greatest difficulty would be the want of petroleum, about the same quantity of which is always consumed for the purpose of melting the snow since we can find no water, nor even any old ice which does not contain an excessive quantity of salt. I am thinking how to replace petroleum by dogs' fat; I shall make the attempt the first time we are obliged to take a rest.

The channel which stopped us this morning, after widening out until it presented the appearance of a lake, is now growing slowly narrower. At 3 p.m. we are able to cross it. We meet with a few expanses of level ice one after the other, intersected by many channels, in one of which we ran the risk of losing a sledge.

I had stopped with the convoy to take an observation of the sun, while Fenoillet went on to choose the way; when we started again the first sledge followed on his steps, but suddenly the

dogs, seeing him before them, instead of keeping to the traces he had left, which described a large curve, rushed forward in a straight line to reach him. In their haste they were deceived by the snow covering a very thin crust of ice, and so they fell into a channel; all the dogs and half the sledge were in the water. The dogs tried to escape by climbing up on the sledge and helped to sink it, and in another moment all would have gone to the bottom. Petigax, who was a short way behind, ran up, and seizing the ends of the runners, which alone remained out of water, called energetically for help, as he felt that he could not hold back this great weight, which was pulling him, too, into the water. We luckily came up in time, and the sledge and the dogs were pulled up on the ice. But in what a state were our things! The load consisted of all our pemmican, of our biscuits, and a rifle. As the boxes of biscuits and of pemmican had been opened, they were filled with water, and the contents soaked—a misfortune which seemed insignificant in comparison with the danger we ran of losing such a precious and nutritious part of our provisions entirely. It was snowing, and therefore useless to spread out our bread and our pemmican to dry them; we found it sufficient to empty the salt water out of the boxes, and after reloading the sledge we set out again.

We come to two vast expanses of level ice, on the second of which we stop at 11 p.m. for our lunch. Since 3 p.m. we have travelled fully eight miles in a direction partly to the east and partly to the east-south-east by the compass; we can hardly believe it, and our minds are in a state of excitement from the dread of becoming entangled in some line of *séracs*, like those of the day before yesterday and yesterday morning. The channels which we meet to-day generally run from west-north-west to east-

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south-east, and for that reason seem to us to be fewer, and offer us little hindrance.

The air becomes more and more foggy and the snow thicker.

Friday, May 18th.—We set out again at midnight. A channel running from north-west to south-east forces us to go for nearly an hour in the latter direction, but then we find it frozen, of great width, and divided into two branches, one of which goes west-south-west and the other to the east. We follow the eastern branch, going well over the new ice, which is covered with a thin layer of snow, and towards 2.30 a.m. are again on the ice-pack, which is tolerably good for the sledges, and make our way in spite of the fog and snow, which is now falling in large flakes, and does not let us see where to put our feet.

We encamp at 5 a.m. Both the dogs and men are very tired, and it is strange that I alone seem to feel much better, in spite of the continual efforts of the last days. Great anxiety and the strain on my mind have been more efficacious remedies for my ailment than the many opium pills with which I sought to cure myself.

The calculation of the height of the sun which I took yesterday evening gives a result more and more discouraging.¹ We have again fallen back, and almost to the 49th meridian. The sun was very indistinct, and an error of 1' in the altitude would cause an error of 10' in the longitude. But these considerations do not greatly diminish the anxiety which is coming over me more and more every day—a terrible anxiety with regard to our fate. After marching for nine days towards the south-east we are nearly on the same meridian, and my hopes that we

¹ 3 h. 17 m. 14 s. east of Greenwich.

might have a westerly wind or fine smooth ice, or that this inexorable drift might stop for a moment, begin to fade away.

We set out again at 4 p.m., and go on very well across some stretches of level ice, and a little also among *séracs* which present no obstacle, until 11.30 p.m. We are stopped for a short time by a channel, and another obliges us to search for half an hour towards south-south-west, but otherwise we have always trended towards east-south-east. A dark form which changes its shape, which has been visible since this morning between east and south-south-west, gives me a vague hope that we may be nearer to the island than my chronometers indicate; it is very unlikely, but at this moment I am much in want of comfort.

Our biscuits were served out to-day in the state of salted dough, but they were not eaten less willingly on that account. This evening we tried for the first time the pemmican which contains fifty per cent. of fat; we have only one box of it; we find it excellent, and much more delicate and agreeable than that with forty per cent., which we have eaten until now.

Saturday, May 19th.—We continued our march shortly after midnight, and went on very well in spite of fog and snowdrift over wide, level expanses of new ice, covered with a thin layer of snow, which does not make it tiresome to drag the sledges.

We meet several channels, one of which, running from south-west to north-east, stops our way at 4.30 a.m. I would wish to encamp on the other side, but to cross it, it would be necessary to go a long way to the north-east, while to the south-west, not far from us, there is a spot where the slightest pressure would enable us to pass. I order, therefore, the tent to be pitched here.

Thanks to the mild temperature, which is generally about

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—10°, the men now sleep and rest well, but as for me, a good many of the hours during which I am in the sleeping-bag are passed in a feverish agitation. I often find it impossible to close my eyes, and then I take out my notebook and Magnaghi's tables; I recommence my calculations, and make all sorts of surmises about our future.

We rise at 2 p.m., and I give the men the full ration for breakfast; it does not seem to me that the increased consumption of petroleum caused by the luncheon is counterbalanced by the additional couple of hours during which we can march when the breakfast has been divided into two meals. Then, the weather is still bad, the sky overcast and the air thick; and two hours' marching under these conditions represents a very small amount of progress.

From four o'clock till midnight we walk on through fog and snow, which is sometimes in minute grains and sometimes in large flakes, over expanses of level ice, which seems to be of this year. At 11.30 p.m. we meet with a channel for the first time to-day; we cross it without difficulty, but just in time, for while the last sledge is going up the bank, a fissure over three feet wide opens suddenly in the middle of the channel.

Although the very bad light does not allow us to see where we step, I think we might have marched more quickly than we did. This succession of forced marches has, indeed, exhausted both men and dogs, as I feared it would; the train of sledges stops at every moment for one reason or another. Our course must be guided by the compass; but whilst previously half a minute was enough to consult it, the man who marches at the head now takes three or four minutes. These stoppages are not only long and very frequent, a fact which at first did not attract

attention, but now the entire convoy, as though seized by a great weariness, is slow to set out again, negligent in taking advantage of the tracts where the ice is good, and drowsy and heavy in all its movements. In the presence, however, of the difficulty of crossing over a channel, or the danger while passing through a pressure-ridge, men and dogs seem to awake, and their former energy to come back to them all at once; but immediately afterwards they resume their way of marching as though fatigued, and seemingly scarce able to drag themselves along. While we were on an expanse of level ice without an obstacle, I counted eight stoppages in one hour.

It is midnight, the darkness and the snowdrift are thicker, and what is the use of wishing to prolong or force our march under such conditions? I give the order to encamp.

This evident falling off in the physical force of my men is a fresh source of great anxiety for me; and certainly the moral depression which has come over them on account of the drift must have also some share in it. I could not conscientiously conceal the truth from them; at any moment some unlucky accident might carry me off from them, and it is absolutely necessary that they should know where they are, and in what direction they may find a way to save themselves without me. I therefore frequently show them the maps on which I have indicated our approximate position.

As for me, it would seem as though my physical energy were renewed by these daily increasing obstacles; I now feel myself very strong, and neither sleepy nor weary. My finger has nearly ceased to give pain, and often, when we are in the sleeping-bag, I unbandage it and open it at the side with the lancet, to let out the matter which is continually forming. It is an operation now quickly performed without pain, while my companions are asleep.

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I should wash the wound with a solution of sublimate, but have given up doing so in order to save time and petroleum. I know that I run the risk of getting an inflammation, but it is the least among the many dangers now threatening our existence.

We saw to-day the recently made tracks of a bear, and this evening inspected our arms.

Sunday, May 20th.—This morning, as soon as we had pitched our camp, I put a little cocaine into Petigax's eyes, which were inflamed and full of tears. Although we have not seen the sun for three days, it seems that the reflection of the snow is still more irritating for the retina. At 2.30 a.m. we were in the sleeping-bag. The weather is still worse, the darkness has increased, and I have therefore decided that this is to be a day of rest. After that, I hope that we shall make better progress to-morrow.

I make an inspection of our provisions, which are now reduced to a very small store :—

Two pots of Liebig's Extract.

Three boxes of preserved milk (2 lb. 15 oz. 9 dr.)	36 rations.
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Four boxes of butter (7 lb. 11 oz. 7 dr.)	36 ..
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Fifteen boxes of preserved meat (24 lb. 12 oz. 12 dr.)	45 ..
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Two boxes of groceries	60 ..
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105 lb. 13 oz. 2 dr. of pemmican for the men	165 ..
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70 lb. 8 oz. 12 dr. of pemmican for the dogs	64 ..
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1 lb. 8 oz. 11 dr. of Italian paste	14 ..
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Half a box of wet biscuits	about 30 ..
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One box of petroleum	58 ..
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We have provisions for eleven days on full rations and fifteen days on two-thirds of a ration ; after that there will still remain about 52 lb. 14 oz. 9 dr. of pemmican, with which we may be able to support ourselves for six days longer—that is to say, that we have

enough to live on until June 7th inclusive. And then? We have still twenty-one dogs; by killing some we shall be able to feed sixteen of them with the remaining 70 lb. 8 oz. 12 dr. of pemmican until the end of May. Is it possible that we shall never see land or be able to take an observation of the sun from now until then? This sun which turns unceasingly over our heads, and of which, since the 17th, we have had glimpses at short and



"AND THIS EVENING INSPECTED OUR ARMS"

rare intervals, but not sufficient to enable us to take observations, must, however, show itself some time or another. The continuation of this bad weather for ten or fifteen days longer, without interruption, would be a truly incredible misfortune. To-morrow we are to open our last case of petroleum, which may last us perhaps for twenty days, if we deprive ourselves of a hot drink after having eaten. We have, therefore, fuel up to June 10th, and that is, without doubt, what is most indispensable for our existence; we have not seen a

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trace of those famous pools of fresh water we had reckoned on finding about the middle of May, and, if we want a drop of water, we must light the stove to melt the snow.

The day passes over very sadly. Our poor dogs seem dead ; for fifteen hours they have been silent, motionless, curled up on the same spot where they laid themselves down when we stopped. The men are fast asleep, and I, agitated by thoughts of the future, am watching. At times it seems to me that it must all end by some catastrophe ; our provisions will be exhausted ; we shall be unable to keep up this terrible struggle against the drift ; slowly the spectre of hunger and frost appears before my eyes. The terrible end of De Long, and still more that of Greely's expedition, comes to my mind with all its horrible details, and in this infinite silence my eyes turn with compassion to the generous comrades who are lying beside me. Like me, they too have families, which are praying for us, and, the powerful impulsion of the affections raises the soul up towards God, gives it more force, and the re-invigorated spirit comes forth victoriously from this momentary depression.

We shall struggle to the last, and, if we must fall, we shall fall fighting. May God protect us !

CHAPTER V

We are Starving. Return to the Hut

CHAPTER V

WE ARE STARVING. RETURN TO THE HUT

MONDAY, May 21st.—Since midnight we have been watching by this dim and wan light for a clearing away of the fog, which does not take place. We have lain stretched in the sleeping-bag for nearly twenty-four hours; our appetite makes itself felt, and as, in any case, we must eat, I think that, in spite of the bad weather, it is better to make some compensation for the consumption of our provisions by a little marching, even if only for a short distance. We set out at 4 a.m., guiding ourselves by the compass across some tracts of level ice, and through some very difficult *séracs* covered with snow, in the midst of which several channels are open. These force us to go a little to the north-east and a little to the south, but allow us very rarely to follow our course.

Petigax's eyes are still very much inflamed, and he seems to be very tired. His tall figure which, even a week ago, rose before me like that of a young man of twenty, when he led the convoy, seems now bent and enfeebled like that of a man of sixty. Fenoillet always goes on first now, "but the voice of the bard is no longer the same," and I try to deceive myself by thinking that it is only a passing weakness, the result of the recent forced marches. The bad light would tire out any one who had to seek

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his way over a surface which he cannot see, which seems level when it is inclined downwards, and to rise up when it is level. And if this were not the case, how shall we get over the fifty miles which separate us from land?

I ought, however, to guard against illusions! To-day, out of the many I have, one passes away; it was very vague, but the intensity of my longing made it almost real. To the north-west, to the north and to the north-east, there stretches the same shadowy streak, with the same line resembling mountains which on previous days I had observed from east to south-east, which had excited in me hopes which became gradually stronger every time that I again saw the same profile always in that direction, where now nothing more is to be seen of it!

The wind has shifted at last to the west, and then to south-west; are we, by way of a supreme tribulation, about to run the risk of being driven back to the north? The bad weather continues, and there is not a ray of sunshine which might allow us to ascertain how far we have drifted; if we have gone on towards the south-west at the same rate as last week, Heaven only knows where we are now. The thought which flashed across my mind last night, of attempting, as a last resource, to make my way towards the south, to Cape Flora, comes back to me persistently. At any rate, I will not depart from my resolution of not changing our course until I shall have been able to ascertain our precise position.

At half-past ten our slow march is stopped by a wide channel; to turn it, we should have to open out a difficult road, the end of which we cannot see, towards the north-west or the south-west. What is the use of making a tiresome journey to the west, when it takes us an hour to do a mile

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to the east? To-day in six hours' marching we have advanced only two or three miles at most between east and south-east. I, therefore, give orders to encamp, and to spread out the sleeping-bag; we shall remain stretched in it and wait until the channel can be crossed, and eat when we see the probability of setting out. It is 11 a.m., and as soon as the men lie down they



ON OUR RETURN

fall fast asleep, although we have slept for eighteen and a half hours since midnight yesterday, and have worked for only six. I, on the contrary feel still stronger, and do not know if it is my physical energy which sustains my moral energy, or the strain on my nerves which braces up my body against fatigue.

At noon the thermometer marks -4° , and a stiff breeze is blowing from the south.

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Tuesday, May 22nd.—This was to have been the day of our return to the hut, and who can tell how far we are away at the present moment from our Eden, of which we often dream, and of which we speak so often as the ideal of comfort and luxury?

I have gone out and have sent out the men several times to examine the channel, which since midnight shows signs of closing up; I have served out the coffee and milk and the pemmican, and, after fasting nearly twenty-four hours, we really wanted it. We set out again about 3 p.m., and succeed in crossing the obstacle which had stopped us.

Petigax, whom I treated with sulphate of zinc, is almost cured; but it is now Fenoillet whose eyes are inflamed; he would not wear spectacles yesterday, as he said that when he wore them he found it impossible to seek out our way. If he, too, fails me, I shall have to take the lead, which I hardly ever did, as I do not understand ice as well as the guides, and because I like to have all the convoy before me.

The weather is always the same; the wind has shifted to the south-south-east. Up to half-past four we meet with rather level ice, and then struggle for two hours in the midst of very difficult *séracs*, the worst, perhaps, which we have as yet encountered. Between them there is very deep and soft snow, which exhausts the men and the dogs; by dint of unheard-of efforts, the sledges advance with difficulty by stages of fifty or sixty feet. We sometimes sink up to the waist at every step for a distance of six or ten feet; then the snow supports us for some feet farther, and then we sink into it again for the whole length of the legs or up to the armpits; and we pull ourselves up on our arms or our knees only to fall again. What a torment! I am

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of the opinion of Petigax, that the *séracs* of the Newton Glacier in Alaska were much easier than these. After them come several channels, some level ice, and then more channels which force us to seek our way sometimes to north-east and sometimes to the south, among more *séracs*, from which we escape with great difficulty.

At last, about 10 a.m., we are upon an ice-pack which is less broken up, and almost level. It bears the traces of many recently closed-up channels—channels which run from south-west to north-east, and were probably closed by the south-east wind of last night and this morning. We encamp a little before noon, as we are all so tired; we have covered about four or five miles towards the east.

The air seems about to become clear, and at 2 p.m., while we are lying down in the sleeping-bag, the sun peeps out. The thermometer marks $+1^{\circ}$ and we all feel very warm; it is the first time since March 11th (the day on which we left the hut) that the temperature of the air is above zero.

At half-past five I am at last able to observe the altitude of the sun, and my hand almost trembles while I calculate the longitude.¹ We have drifted to the west much less than I feared, and have gained on the whole more than a degree and a half towards the east. The wind subsides and the sky becomes quite clear; the air is pure, and I wait with anxiety for midnight, to be able to ascertain the latitude and our precise position.

Wednesday, May 23rd.— $82^{\circ} 1' 2''$; we are therefore about forty miles from the island. So I must continue to march exactly towards east-south-east, and as soon as land is sighted, leave

¹ 3 h. 26 m. 7 s. east of Greenwich.

² $82^{\circ} 1' 6''$ N. lat.

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behind everything not absolutely indispensable and make a supreme effort to reach it by forced marches, if, indeed, our physical condition will allow us to do so.

Instead of the anxiety of the last few days, I now feel perhaps an excessive degree of pleasure, and the very fine weather, which seems likely to last, certainly contributes towards it. As soon as I have finished my calculations I call the men, and after our meal show them on the map the spot where we are, with which they do not seem much pleased. The guides thought that they were much more to the east, which comes, I believe, from the fact that in these latter days they were completely deceived as to the ground covered by their legs, but I, who, in the rear of the convoy, looked often at my watch, and kept a reckoning of the many stoppages and of the direction in which we were going, was well aware of the very great slowness of our progress.

At a quarter to two we are on our way over level tracts of ice, both old ice and ice of this year, intersected by channels which are not too difficult; in crossing one of them, however, the sledge which carries the sleeping-bag and the tent upsets and falls half into the water, but the water, luckily, does not get into the bag, as it was tightly rolled up. At four o'clock we again encounter some terrible *séracs*, worse, if possible, than those which we met yesterday. We advance foot by foot, helping the sledges, lifting them up and pushing them, and when, after a struggle of two hours, we come out of that horrible ice, we feel as though our legs and arms were broken with fatigue.

A fresh wind has meanwhile risen from the east; nothing but that was wanting to diminish the distance accomplished by our laborious day's work. In compensation it brings one advantage—

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all the channels we meet on our way are closed up, or are closing up, and from 7 till 8.30 a.m. we go on over a succession of level expanses of new ice, the little snow lying on which is hard. Then more *séracs*, a few level spaces, and again *séracs*.

At half-past nine one of the guides asked me if it would be long before we encamped. He said that we were close to a place suitable for pitching the tent, and that perhaps it might not be easy to find another farther on. I understand what he means; it is the first time that these men of iron give in to fatigue, and declare, though not openly, that they are tired. I had already remarked that during our short passages they sat down on the sledges, a thing they never used to do. Yet they have not worked more to-day than yesterday, and I, who was formerly in comparison with them like a thermometer marking the minimum of fatigue, am not tired, and feel capable of walking for a couple of hours more. I give orders to encamp, and make haste to calculate the height of the sun, taken this morning during our march. We have gained a little more towards the east.¹

The sky is again overcast, and the east wind has become very strong; it subsides a little about 5 p.m., and shifts towards north-east. Heaven grant that it may go on shifting until it blows from the west, for if the obstacles to our journey increase, I do not know when it will end. In our march of eight hours this morning, we have barely, I think, covered six miles.

We have found the tracks of several bears; there must have been three large ones and a small one, going from south-west to north-east.

At 10 p.m. we set out again, finding some old and new ice moderately level until midnight, when I make a short halt to take

¹ 3 h. 27 m. 8 s. east of Greenwich.

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the meridian altitude of the sun, which is showing itself between the clouds.¹ But what does certainly not show itself among us is good humour, which is at a very low ebb among my men.

Thursday, May 24th.—Our way was again good for a short distance, but then for a couple of hours horrible *séracs* with deep and soft snow like that of yesterday. The wind blows strongly from the east, and stings our faces and raises up a snowdrift which penetrates among our clothes wherever the snow, in which we sink at every step, has not yet penetrated. If it were only a question of glory, we should encamp to wait at least for fine weather, but our lives are at stake, so we persist in advancing with difficulty, making our way foot by foot, disheartened by the conviction that the wind is carrying us back at a greater rate than we are advancing. We are like squirrels, which people keep for amusement in cylindrical revolving cages! After the *séracs* come some small level tracts, and then a belt of channels and ice so broken up that we are obliged to make our way with the ice-axes. It takes us more than an hour and a half to advance 1,000 yards!

It is 8 a.m., and I have the tent raised behind some blocks of ice; in spite of this shelter the wind comes down in such violent gusts that we have to strengthen the tent with ropes. We have again seen this morning several tracks of bears.

The latitude taken at midnight is 82° 3'. We have been drawn a couple of miles towards the north, in consequence, probably, of the south-east wind of the day before yesterday. If this prolonged and furious east wind makes us drift towards the west in the same degree, more than ten miles must certainly be deducted from the amount we have travelled!

We have still provisions for the dogs for two days, and

¹ 82° 4' 39" N. lat.

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incomplete rations for ten days for ourselves. We have already finished the biscuit, and there is only enough Italian paste to be served out twice. Besides this, after to-day I give out no more tea or coffee, but reserve it for the time when we shall be living on pemmican.

The wind blows violently all day. The men are cast down and do not open their lips. I still hope to reach land in the first ten days of June, but truly in the present state of our affairs it would seem a bad joke on my part to mention my hopes again.



"I HAVE THE TENT RAISED BEHIND SOME BLOCKS OF ICE"

At any rate, I am convinced that, even having regard to our mental condition, it is better to go forward, so we set out again at 9 p.m., although the wind shows no sign of subsiding.

Friday, May 25th.—We go on until 7 a.m. without stopping, across difficult *séracs* and channels and broken ice both old and new, opening out a way by means of our ice-axes for several hours in succession. The east wind, which is still blowing strongly, had the day before yesterday closed up all the channels which ran from north to south, but it is now opening them again; it blows in our faces while we are marching; in spite of the mild temperature the

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suffering it causes stupefies us, and when we encamp we are very much fatigued. In ten hours of marching we have travelled four or five miles! We saw several gulls and a flight of little auks, which caused much excitement among the dogs.

I order Pecora, the only long-haired dog still remaining, with the exception of Messicano, to be killed. I had kept it until now more for the capacity it showed in leading a team than for its strength, but at last it is worn out. All these long-haired dogs were, as a rule, less wild and more docile than the others; but, on the other hand, they had less endurance. Canepa divides Pecora's thin carcass into eighteen parts, since that is the number of dogs which now remain. We have still thirty-seven pounds of pemmican for them, which will furnish reduced rations for three days; that, with the flesh of a couple of dogs, will enable me to keep sixteen until the end of the month. I shall reserve for the men the rest of the pemmican of superior quality which had been originally intended for the dogs.

When taking out the biscuits, Fenoillet made the painful discovery that those at the bottom of the box had been swollen by the water which had got into it, and that we have therefore less of that precious food than we thought. After the adventure of the bath, our biscuits were served out in the state of dough, when it was very difficult to keep to the quantity fixed for the ration; yet now, by observing great economy, we shall still have enough for five or six days. After to-day it shall be only served out when we have pemmican to eat. The preserved meat and the soup must be taken without bread.

Towards noon the wind seems about to shift to the north, but it does not subside; later, we are enveloped in a dense fog, which lifts a little about half-past nine, when the wind falls. It is snowing,

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but in spite of this we harness the dogs and set out. Until midnight our course winds about in the midst of *séracs* a little less difficult than those of yesterday.

Saturday, May 26th.—The bad weather continues. With the exception of five or six fine days which came at two intervals, there have now been twenty-eight days in succession on which we have had cloudy weather, snow, a foggy atmosphere, and wind.

We are upon ice which must have been formed this winter, and meet with several level tracts of much more recent formation. Last week, with the blue ice, were mixed up many large and small blocks of white ice, soiled with earth. Yesterday, especially, we met a large number. To-day, hardly any are to be seen, and one might say that this very recent ice-pack was broken up not much more than ten or fifteen days ago.

We also meet with many small pools and channels, which are, luckily, frozen over, and the snow is less deep than what we had up to yesterday evening, in which we sank up to the waist. We must direct our course towards east-north-east to take advantage of a better surface, as from east to south there stretches a belt of *séracs* which appals us.

We encamp at 6 a.m. In eight hours we have progressed five miles. It should be remembered that during the first hours of our march among the *séracs* we had always to prepare our way, and so advanced but slowly.

I have served out our soup, which is composed of:—

	lb.	oz.	dr.
Preserved meat	1	10	7
Pemmican	1	1	10
Butter	0	5	4
Liebig's Extract.			
A handful of biscuits.			

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We found it excellent, and being thus made up, it will form an easy transition to a dietary without biscuit.

After the soup, I forewarned my men against a probable surprise on the part of the ice-pack, which, I fear, has drifted very much to the west in these last three days. I proved to my companions that, if our situation is not enviable, it is better than it seems to them. If at my first observation for longitude we find that we are to the west of the 51st meridian, we shall go towards the south to touch land at one of the Albert Edward or Harmsworth Islands, which lie between the 49th and the 51st meridians at little more than about thirty miles from us, and we shall be assisted in our march in that direction by the same drift which hinders so much our advance towards the east. By giving up our coffee and milk we can still reckon on having firing for twenty days, and there will then remain four pounds of petroleum in a small reserved box which, as such, was not entered on the list. As long as we can have fire, we shall not feel our privations very much, more especially as we are imposing them on ourselves gradually. After twenty days, we may still have eight dogs, enough for two sledges, which can be loaded with only 275 lb. by throwing away a part of the clothing and the sleeping-bag. Such will be the state of our affairs towards June 16th, and we shall then have still about twenty-six pounds of pemmican—that is to say, as much as will just suffice to live up to the 20th. We have therefore a month before us, and unless we should be utterly abandoned by Providence, we must touch land before then in the neighbourhood of Teplitz Bay, or at least Cape Flora, or be able to kill a bear or a seal.

Then, in the last extremity, have we not our dogs? The last eight may keep us still alive for three weeks. We should not, therefore, allow ourselves to be alarmed by the danger of

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hunger, but must keep up our courage, which greatly contributes to maintain the strength of our physical energy.

This speech addressed to my companions relieves me too, and gives fresh strength to my hopes of being able to surmount the terrible difficulties of the present. The men smile and seem convinced. Canepa listens to me, but I can read on his countenance that admirable indifference shown by the sailor, who is accustomed to place his life implicitly in the hands of his chief.

The sky is still overcast ; it is snowing slightly, and there is a breeze from the north-east. At six we resume our march ; we cross a channel and some expanses of level ice, and then some *séracs* which are not too difficult. Then another tract of recently formed ice, several channels, and more *séracs*, among which we advance slowly until midnight.

Sunday, May 27th.—At 1 a.m. a broad channel running from north to south and forming two lakes stops our march. We attempt to cross between the two lakes on a sort of narrow isthmus, but the ice does not bear and have to come back. It does not suit us to try and turn the lake which opens out to the south, as in that direction there is a belt of ice which is too much broken up. I therefore think it more advisable to pitch our tent.

I have resolved to abandon a sledge ; we have to put the others in order, as they have been much shaken by our encounters last week with the *séracs* ; we must also mend the sets of harness which are in rags, and reconstruct all the loads. We shall take our Sunday rest, though we may set out again if we find an opportunity of crossing to the other side of the two lakes.

The breeze has shifted to west-north-west ; the thermometer indicates -8° , and the atmosphere is still hazy.

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From the sledges we leave behind, we take away an under-runner, and put it on one of those we keep which wants this part, so essential to enable it to run. All the useless cases are thrown away and the pemmican is put into a bag. We place the small quantity of biscuit remaining in a box which held pemmican. Putting the Italian paste aside, there remain to us:—

	lb.	oz.	dr.
A box of groceries (thirty rations).			
A pot of Liebig's Extract.			
Preserved meat in a box	13	0	0
Salt butter	5	15	3
Condensed milk	0	15	13
Pemmican	88	2	15
Pemmican for dogs	33	1	1

We cut up our sleeping-bag, taking away all the upper part from the head downwards nearly to where our knees come when we are stretched in it; about a third of its weight is thus got rid of, and all the dirt which had got into our bed, more especially in the folds. The part we cut off, when thrown out of the tent, is immediately gnawed with great avidity by our poor dogs, who are kept fasting to-day as they are doing no work, and we have thus found a new resource for feeding them.

We put on for the first time our *kümagers*—shoes of nearly the same shape as the *finkses*, but of ox-hide slightly tanned and sewed so as to keep out water. Before leaving Teplitz Bay we put a mixture of grease and tar on them, and this has kept them soft and makes them still more waterproof. When they are worn, a good deal of sedge grass is put inside and they always keep the feet dry, even when walking for a long time over soft wet snow, whilst under the same conditions the *finskos* soon become saturated with water and consequently useless.

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After reloading our sledges, I calculate that one carries on an average 220 lb.

This evening we put our last ration of Italian paste into the soup. We drink after it a glass of fresh but dirty water, and after repeating our Sunday prayers, followed by a shout of "Long live the King!" which resounds above our anxieties and our hardships, we lie down on our reindeer-skin carpet. The ice between the two lakes becomes stronger and we hope to be able to cross it at midnight.

Monday, May 28th.—We set off shortly after midnight, but lost an hour in crossing the channel between the two lakes, which, although the greater part of it was frozen, obliged us to make many windings, as it was composed of several ramifications, to be crossed in succession. It was only at two o'clock that we were able to proceed at a moderate rate over level ice, and among easily crossed *séracs*. At four we came upon an ice-pack which was still better, and then a succession of level fields of ice covered with hard snow, such as we had not seen for a fortnight. A few small pressure-ridges, which were soon passed, then expanses of more level ice, and we go on hopefully until 11 a.m., when we encamp behind a block of ice to shelter ourselves from the north-west wind which continued to blow rather freshly all day.

We have travelled seven or eight miles towards east-south-east. Although the dogs had fasted for thirty hours, they went on very well, thanks, I believe, to their rest of yesterday. At 11 p.m. we again resumed our march on the ice-pack, which continues to be very good. Five or six days more like this and we shall be saved!

Tuesday, May 29th.—Up to about two o'clock we go very well over level ice covered with a thin layer of hard snow; there

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are no pressure-ridges or channels, only a few lines of harmless blue *séracs*, through which we make a way for the sledges in a moment with a few blows of the ice-axe. But suddenly we come up to such a wide channel that, on account of the fog which at first conceals the opposite shore, it seems as though we had come to the edge of the open sea. On looking more attentively we make out to the north-east the white bank on the opposite side, and it appears that this piece of water grows narrower towards the north. We go on, therefore, along the edge towards the north-north-east.

The air becomes more transparent, and the north-west wind would seem to have at last swept away the dark clouds which have hid the sky for so many days. Before our eyes is a very large lake; its greatest length is from north-east to south-west, in which direction it broadens out to over 1,000 yards.

At 4 a.m. we succeeded in turning it by the north, and go on again towards the east, but soon after we meet with another channel running towards the north and seeming as if it were joined towards the south with the lake we have just met. We turn our steps, therefore, towards the north, and cross a vast and splendid field of level ice, which stretches alongside the channel; at six o'clock we are at the opposite end, where a belt of very difficult *séracs*, among which I hesitate to risk myself, extends.

While I am taking the altitude of the sun, I send the guides to explore the channel, which stretches out of sight among the *séracs*, and there is no alternative but to return to the south, going over again towards the south-west, the way we took this morning, or else push on to the north among all this broken ice. If we make a mistake in our choice, we run the risk of losing the work of two days. I prefer to stop and wait before coming to a decision, after having taken an observation for latitude. We pitch our tent.

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I immediately calculate the longitude, which I pretend to find comforting.¹ In six days we have not gained towards the east an entire degree of longitude, which in this latitude would represent nearly ten miles. We must, therefore, gain about 6° in order to come to the meridian of Teplitz Bay.



"A VAST AND SPLENDID FIELD OF LEVEL ICE"

While I am taking the meridian altitude, I see a great movement in the ice; the channel has grown much wider; now it is changing its shape; and it appears as if about to close up again. I think that it is better to stay where we are; our latitude

¹ 3 h. 31 m. 7 s. east of Greenwich.

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is $81^{\circ} 49'$,¹ and at present it does not suit us to go to the southwest.

A little before six the water has almost entirely disappeared, and it seems that only a few small canals remain open. I take the altitude of the sun,² and we set off towards the east, but soon find ourselves in a serried network of small channels, from which it is very difficult to extricate ourselves. After working for an hour and a half, we shall get only 500 yards farther. While the guides are seeking vainly for a way forward, I perceive a fissure is opening quickly between them and us, and that a thick fog is about to envelop us. I call back Petigax and Fenoillet, who cannot reach us. I run to the sledges, which are looked after by Canepa. I take a rope, of which I throw one end to my men, and by hauling it we bring the ice-floe on which I am up to that on which are the two guides, and they are thus able to rejoin the convoy.

Fissures and channels are opening on all sides, and vast expanses of water reappear. I decide on returning to the ice-pack of old and solid ice where we were encamped this morning, but it is too late; a wide channel separates us from that level ice which for us, at present, almost represents the land, and we remain prisoners on a circular ice-floe, which may be a hundred yards in diameter.

Then begins a whole Odyssey of incredible efforts to cross channels, and to go forward by passing from one floe to the other. The channels are full of pieces of ice; I jump upon one of these, and making use of a bamboo pole, to which we have tied a hook, both as boat-hook and oar, I cross some of the narrower

¹ $81^{\circ} 51' 45''$ N. lat.

² 3 h. 30 m. 31 s. east of Greenwich.

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channels, carrying with me the end of a rope, the other end of which is held by my men. On arriving at the opposite shore, I plant the pole or an ice-axe in the ice, and tie the rope to it; my men then pull it, and thus without fatigue bring together even very large ice-floes.

One cannot imagine how easy it is to move them. A rope of only an inch and a half in circumference can tow a rather thick piece of ice measuring as much as 200 square yards superficially, and forming a mass weighing, perhaps, 1,000 tons.

Acquiring more and more dexterity in my new system, I navigate all night on the ice-floes, carrying the tow-line now to one side, now to another, several times running the risk of taking a bath, but almost always succeeding in executing my plan. My men seem to take pleasure in their new business of ferrymen. We have unharnessed the dogs, and we lift the sledges from one floe to the other ourselves, for at the first crossing we nearly lost one on account of their nervousness. The poor beasts are now quite dejected, and follow us quite closely, as if afraid of being abandoned. At midnight we take our pemmican while waiting till we are able to cross a broad channel which is closing up slowly.

Wednesday, May 30th.—Our Odyssey continues until 6 a.m., when after crossing a small ice-field, which we had reached with much fatigue, and thought would lead us to a place where we should be nearly safe from the water, we find in front of us a wide channel which stops us, and so we erect our tent.

This travelling in the midst of moving ice is provoking work. A place where a crossing has been prepared opens; another spot where we have given up the idea of crossing, as it was evidently impossible to do so, closes suddenly and becomes passable when, after much toil, we had made other arrangements.

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In a word, there are moments when one would say that the ice became animated on purpose to spite one.

The stove had hardly been lighted when the channel seemed to be closing, and I stop unharnessing the dogs. We have our dinner, and shortly after it seems as though we might be able to pass. The guides set to work to prepare an incline on the bank, which is rather steep; Canepa and I pack up the cooking-stove, the sleeping-bag, and the tent, and behold, the channel, instead of closing up completely, opens out again. I have the camp pitched again, and we lie down on the reindeer-skin, the remains of the famous bag which we cut up yesterday evening, to the great delight of our dogs. We give them what remains of the dog that was killed yesterday. We have worked for twelve hours continuously and made an advance of 1,000 yards. If we go on at this rate, we shall not get to Teplitz Bay even by next year.

The fog which came down yesterday continues, and the sky is overcast; the fine weather has lasted twenty hours. For twelve hours we wait for a favourable movement in the ice, without which we cannot leave the small ice-floe on which we are encamped. Meanwhile, the whole ice-pack seems to be turning round, and the channel which stopped our way now lies to the west of us.

Towards 9 p.m. another channel which surrounds us to the east closes up. In the twinkling of an eye we are on foot, and a few minutes later again cross the tract of level ice, going back over our track of this morning. We cross the pressure-ridge which has been formed in the place where the channel ran half an hour ago, and now are upon ice which still bears the marks of our footsteps. All our work of last night has therefore been thrown away. If we had not stirred, we should be farther to the east than we are. Truly, a splendid result for so much toil!

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To the east, beyond this level tract, is a channel, beyond which, again, we see a wide expanse of smooth ice, which, as far as we can make out, our feet have not yet touched. The channel is broad, but a large ice-floe is within our reach, and can serve us as ferry-boat. We embark our dogs and our sledges upon it, and I go off alone, sitting on a small piece of ice, on which I hope to reach the opposite shore, and there attach the end of the tow-line. The piece of ice, which is not very strong, begins to break up



THE EXTRAORDINARY EMBARKATION OF PETIGAX, CANEPA, AND FENOILLET

when half-way across ; I am already in the water half-way up to my legs, and am just in time to seize a large slab of ice close to the shore I am longing to reach, without which I should have had a complete bath. The rope is fixed to the block of ice, and the men begin to haul their little island across. The dogs and the sledges, which are crowded together upon it ; Petigax and Canepa, who are pulling ; Fenoillet, who is kneeling at the front of this strange vessel, leaning forward and carefully pushing aside the smaller ice-floes which hinder its progress, form a truly artistic

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picture; and in spite of all the hardships we are undergoing, I much regret that I have no more films to photograph such a fantastic group.¹ When we passed from the floating ice to the slab, in order to cross from it to the level ice we were so anxious to reach, the slab breaks off from the solid ice, and we are again imprisoned on a space of thirty yards. I attempt in vain to ferry myself across on some piece of ice; those which are within reach of our boat-hook are too small, and twice again I run the risk of taking a bath, but all to no purpose.

The new day finds us there, sitting on our sledges and waiting for liberty.

Thursday, May 31st.—The wind, which rose a few hours ago, increases, and blows freshly. On account of that, and because I am all wet, and perhaps partly also because I am hungry, I feel very cold. We are still in expectation of a movement of the ice, which yet delays. We raise the tent as well as we can and prepare a meal, which is several hours behind-hand, for we have not eaten since nine yesterday morning, and it is now almost two o'clock in the morning. We have hardly done devouring our pemmican when Fenoillet, who had left the tent for a moment, succeeds in hooking an ice-floe, on which I immediately embark, and after a short but perilous navigation, I set foot at last on the vast plain of ice, towards which all our efforts have been tending since yesterday. At 4 p.m. we are marching across it, directing our course to the east.

We meet with some channels, one of which we cross with a daring which we never showed previously. After my doughty deeds on the ice-floes and our brilliant crossings, the men have all

¹ It was afterwards very well reproduced by Signor Von Eles from a sketch by me. (See illustration on p. 563.)

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acquired a little more confidence in the perfidious element. But at half-past six we are stopped by a belt of small ice-floes, separated by a regular labyrinth of channels and lanes. After the lesson we got yesterday, I shall certainly not run the risk of pushing forward into the midst of them, where we are exposed to the danger of wearing out our strength with six or seven hours of work, while advancing only 400 or 500 yards.

The ice-floes are moving, and I hope that the continuance of the westerly wind, though it is so light, will bring them close together. I order the tent to be raised. The sun appears, and I am able to take a meridian altitude to the south by means of the natural horizon. I have taken one also with the artificial horizon, which differs by 6' from the former, in which I have, however, greater confidence. I calculate our latitude to be $81^{\circ} 56'$.¹ We are nearly at the height of Cape Fligely. If, when the temperature rose, our chronometers had resumed their former rate of going, we should be a degree more to the east than my calculations show, and in that case we should be about thirty-five miles from the island. Now in the first fortnight of this month we gained a little over twelve miles in longitude, in the last week about six, but I do not know if we shall do as much this week. At that rate we shall require two months to travel the thirty miles. The outlook indeed is not pleasant.

To-day we see a number of birds—little auks, guillemots, and gulls; and their presence spreads a feeling of life over the immense death-like solitude which surrounds us. A dark form which extends from east-south-east to south-west continually attracts my eyes; but I reject decidedly the illusion that I could be nearer

¹ $81^{\circ} 56' 28''$ N. lat. by the natural horizon; $81^{\circ} 50' 41''$ N. lat. by the artificial horizon.

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to land than is shown by the results of my astronomical observations. The men are asleep, but I cannot close my eyes, and it is easy to understand why. How is this Odyssey to end? Shall we live some months longer like so many Robinson Crusoes, suffering partly from hunger and partly from all the hardships and the obstacles which this icy desert presents?

At one o'clock in the afternoon it begins to snow, probably to immediately counterbalance the ray of sunshine which came out at noon. The bad weather has been wonderfully steady during all this month. At 3 p.m. the ice in front of us has closed up. We fold up the tent at once; the dogs have remained harnessed to their sledges since this morning. Partly with the help of floating pieces of ice, and partly owing to the movement of the ice-pack, which is still pressing forward, we extricate ourselves from the greater part of these channels, and cross four very fine tracts of level ice separated by wide channels, over which we pass without fatigue and with little loss of time. We then meet with *séracs*, which are not very difficult, and some more level expanses. The snow everywhere is better than last week. At 10 p.m. we are stopped by a broad channel which we cannot cross, and is increasing in width. As we are all very tired and very sleepy, I give orders to encamp and to feed the dogs.

Friday, June 1st.—We have slept for twelve hours continuously; from time to time one of us went out to examine the state of the channel. It is only possible at three o'clock to cross it. We harness the dogs, and at half-past four, after a good deal of fatigue, we are on the other side on an extensive plain covered with good snow; beyond it we cross a half-frozen channel without much difficulty; then two vast expanses of level ice, and we are stopped at last by a wide channel, the banks of which are moving.

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Rather than cease to advance, I embark on an ice-floe, and set out to fix the rope to the opposite side, up to which we draw, little by little, a large ice-floe, on which the dogs and the men are crowded together. It takes two hours to make this crossing; we traverse another tract of smooth ice, and then another channel, which makes us lose two hours. Here we are forced to send across one sledge at a time, as we have only a rather small ice-floe at our service, on which Canepa and Fenoillet, with fifteen dogs, are the last to embark. But the great weight of this last load makes the floating island sink a little, and it threatens to come to pieces while on its way. Petigax and I pull as quickly as we can, and our two companions escape with a slight footbath, a matter to which we no longer pay any attention.

At every moment our feet are in the water, and as for me, with the special ill-luck of which I seem to have the monopoly, I am satisfied when I pass half a day without being wet up to my knees.

At 10 p.m. we are again on our way, but not for long. We meet another channel, which shows innumerable ramifications running in every direction, and beyond it there are many other channels—a regular lagoon. We busy ourselves courageously among them, and cross four or five branches; we are then stopped, while on a piece of ice about thirty yards broad and only a little longer. The ice-pack is moving and the channels are widening out; it is impossible to go forward, and we cannot even go back. We encamp, and wait philosophically till the ice closes up.

I have worked out the calculation of an altitude which I took during our march, and the result is discouraging. Since Tuesday evening we have gained four miles. If by Monday the state of the ice has not changed, I shall reduce our hot meals to one

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every twenty-four hours ; it is the only reduction we can make, since we now cook alternately pemmican only and pemmican with preserved meat ; of the latter we have only two boxes—that is to say, enough for to-morrow and Sunday. For three days we have made neither tea nor coffee, not even after our meal of pemmican, after which we are accustomed to drink a glass of water, although it is hardly suited to cleanse the mouth from the fat which that food leaves in it.

I serve out to each man every day a half-tablet of sugar (about six drams) to put into their leather water-bottles, which, now that the very cold weather is past, we again find very useful. Each of us has his own, and uses it after meals. Every time we cook, a glass and a half of water are given to each man—that is to say, three glasses, which make about a pint and a half, every twenty-four hours. By adding some snow and shaking the bottle well, that quantity serves to assuage our thirst for three days. But we cannot afford to throw any away !

By cooking only once a day we might have petroleum up to the end of June. It will be certainly a great privation to give up the warm food which renews and strengthens us, the more so that raw pemmican has a sickening taste, and seems as if it contained a great quantity of sand.

To-day, while crossing the level stretches of excellent snow, we walked very slowly and made frequent stoppages. The want of biscuits, and especially, I believe, the suppression of tea and coffee, produce an effect on the men's legs. I really do not know by what miracle I go on so well ; I eat only pemmican, which a month ago I could not digest. My finger pains me still ; I continue to lance it every two or three days, without being able to cure the sore, because I would certainly never think of wasting petroleum to boil

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water for it. At any rate, it seems to me that I have newly acquired great physical energy, which is perhaps the result of my moral energy being strongly excited by danger, by the struggle for our preservation, and by a great desire which surpassed, perhaps, even the longing for life—the desire that all our fatigues and our sacrifices may not be lost, and that Italy may know that her sons have acquitted themselves honourably in the struggle which has lasted for centuries, but which is new to them. Oh! we must carry and we



"WE ADVANCE WELL OVER EXCELLENT SNOW"

shall carry this news to our Prince, in spite of the currents, in spite of winds and of all the obstacles which surround us on all sides!

Saturday, June 2nd.—There is a breeze from the north, the sky is overcast, and the air is dark as usual. We remain encamped for fifteen hours up to 2 p.m., waiting until the ice before us becomes fit to cross. We have not even unharnessed the dogs since yesterday evening. They remain more quietly thus, when we give them nothing to eat, now that we have got rid of all those which used to gnaw their harness.

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The channels are at last beginning to close ; after two hours' work we succeed in reaching a very fine stretch of level ice, followed by several others ; from four till half-past five we advance well over excellent snow, and our hopes rise again. At half-past five we are again in front of a very wide channel running from south-south-west to north-north-east. We follow the latter direction for half an hour, then the channel forms an angle and turns towards the north-west. I do not wish to undertake a useless journey, since our legs are evidently feeble, and every step reckons for the diminution of our stores and of our strength ; therefore, rather than go towards the west, I have the tent pitched.

The dogs have not eaten for forty hours. We kill Gianduja, who is very fat, for henceforward we must kill the biggest dogs in order to have the largest number of rations. With three of these dogs, and by giving the survivors a feed every forty-eight hours, I hope to go on for eight days, and shall keep for ourselves the nineteen pounds of their pemmican which still remain:

Sunday, June 3rd.—It is the Feast of the Constitution ! Who can tell how anxious they all are at the hut ? We often think of it, but cannot struggle more than we are doing to reach it. From midnight until six in the evening we have been almost continually moving, sometimes with the sledges, sometimes alone, to seek a crossing to the south, to the north, in every direction, making altogether very insignificant progress to the east. This morning, after having wandered about for a long time, we succeeded in embarking, at the risk of losing a sledge, on an enormous ice-floe, which, driven by the wind, was floating near the level tract where we had passed the night. We hoped that this great slab of ice would continue on its way, and end by touching the opposite shore of the channel ; instead of that, it stopped in the very middle of it, and we stayed

there, prisoners for some hours. Then, when we did reach our goal, we found our tracks of yesterday ! It drives one to despair ! After toiling for so many hours we find ourselves at the same place ! We go on for five hours towards east-north-east, crossing six or seven channels with more or less trouble, and then encamp, worn out with fatigue, and benumbed by the north wind, which is blowing very freshly. We raise our beautiful banner on the boat-hook in honour of the National Feast ; I expect that it is the last time that we shall take it out of its case.

I have put the last three rations of preserved meat into our pemmican, which henceforth will constitute our principal article of food. Whilst it was being cooked another small misfortune occurs to increase the troubles of our existence : the bottom of the large saucepan, which had hitherto resisted, bursts. As in the other case, we adapt the cover to the lower part, and in this way we shall be able to make use of it, but the double bottom will certainly require a greater consumption of fuel.

If we could kill a bear or seal we should be quite easy about our future, but this good luck does not occur when we chance to be in extreme want of it. To-day we have seen the track of a bear, but the animal has not been encountered, so far. And we often see seals, but always when in the water, where even if we did kill them we could not arrive in time to seize them, for as soon as they are hit they go to the bottom. It must not be thought that we could make use of the *kayaks* ; they are so torn that it would take a week to mend them before putting them in the water, and as at present situated we cannot allow ourselves the time to do it.

This morning, while we were running up and down along the large channel, which made us lose nearly an entire day, we saw a

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very large fish, which seemed to be a young whale. It had a part of its back and the end of its tail, which showed a fin, out of the water only. Two small jets of water indicated the place of its head, which did not, however, rise.

At noon I was able to take the meridian altitude ; we are at $-81^{\circ} 44' \text{ N. lat.}$,¹ at the height of Cape Brorok ; but who can tell when we shall reach it?

Monday, June 4th.—It snowed yesterday evening, and it continued to snow all night. We leave early, and at eight have already succeeded in crossing the large channel near which we were encamped. We meet a succession of level tracts, separated by water which makes us lose time, although we cross it with a daring and an unusual dexterity at which we ourselves are surprised. The presence of these level tracts gives us fresh energy, and the painful experience of the past teaches us.

We go a short way to east-south-east, and sometimes to the south or to the north, but we advance, and always make some progress towards the east. We are checked for two hours by a belt of broken and moving ice ; then, when we resume our march, while Fenoillet on one side of a small channel and I on the other are making a passage for the sledges, a large walrus rises up suddenly between us, coming straight out of the water as far as half of its body. It roars and turns in a threatening way towards Fenoillet, who, without losing a moment, throws himself down on the ice, and runs off on his hands and knees, as nimbly as a cat, from the ferocious beast, which sinks at once, and does not reappear.

During my expeditions in the character of a ferryman, I had never thought of this danger, against which Nansen had put me on my guard.

¹ $81^{\circ} 44' 2'' \text{ N. lat.}$

We are Starving. Return to the Hut 573

We do not stop till half-past five that evening, when we come to an extensive belt of broken ice, intersected by many channels. We are very tired, yet to-day our spirits are much higher. But still, how different from the state of our minds a month ago, on May 4th ! We were talking of the banquet we would have on nearing the hut, and to-day are seriously discussing whether it would be better to eat the pemmican raw and to cook the dogs' flesh, or to go on using the petroleum to cook the pemmican and then eat raw dog; and I have been thinking of it for twenty-four hours.

The atmosphere is still hazy; the sun has not been seen since noon yesterday. What perseveringly bad weather ! I hope that I have travelled to-day four miles towards the east; it would be the daily average by which I could hope to reach the island by the time we should have come to our last piece of pemmican and our last drop of petroleum, and we shall be reduced to that extremity in eleven days.

Tuesday, June 5th.—From 6 to 8 a.m. we have toiled without taking a moment's rest, crossing several channels and small floes, only to advance hardly 1,000 yards; and so, as yesterday, we remain imprisoned on a block of ice which, on account of the continual movement of the floes caused by the stiff wind from the north-north-east, has been completely detached from the surrounding pieces. Only after waiting for an hour and a half do we succeed in extricating ourselves, at the risk of falling into the water with the sledges, and we continue our march across such rugged ice that we are forced to make our way with the ice-axes almost step by step. Later we meet a stretch of level ice, but when we encamp, about five o'clock, we have progressed in all a little over three miles towards the east.

Our future is as dark as the atmosphere. The pemmican,

which we dissolve instead of boil in order to economise our petroleum, and all devour with the avidity of animals, reminds me of the mixture of reindeer-skin and lichen which formed the last meals of the survivors of Greely's expedition. But I drive these thoughts away from me, and prefer to close my eyes and live only in the present. It will have whatever end God pleases.

We are now much tormented by thirst; for two days I drink the whole of my share of water, which never happened to me before, and I often awake during my sleep wanting to put my flask to my lips. The same thing happens to my men, and we all sleep with our water-bottles under our heads, in order that the contents may not freeze, and that we may have them within reach.

Wednesday, June 6th.—We set off at 6.30 a.m., and worked exactly an hour to make an advance of 150 yards over broken ice. We then meet with some small tracts of level ice, separated by channels which do not give us much trouble; in spite of their frequency, the ice-pack presents a somewhat better aspect than in the last few days. The weather is always the same—a north wind, with occasional gusts of snowdrift; nothing is seen of the sun but a feeble ray towards mid-day. The uncertain light obliges me to wear spectacles, which I do not generally use.

In the afternoon we work continually to help the sledges, which are stopped at every step by the ice bristling with spikes. While crossing some floes, I am struck by a sledge, and fall into the water, but wet myself, luckily, only up to the upper part of my legs, and go on without changing, as I do not feel the cold, thanks to the warmth I procure through my excessive toil.

At half-past four we are encamped on a small tract of level ice. We have ten hours of continual marching without a rest; we have perhaps got six or seven miles farther and are very well pleased.

"WE . . . ARE BREATHELESS AND WORN OUT WITH FATIGUE"



We are Starving. Return to the Hut 577

I now hope to reach one of the three islands which are to the north-west of Jackson Island. On land we shall have many chances of shooting game, and when the ground no longer flies from under one's feet, as at present, our spirits will rise and we shall regain our former energy.

For our soup this evening I have mixed our pemmican with that for the dogs, which on being heated exhales a strong smell of fat, certainly not of superior quality,¹ but our appetite is great and we do not mind this odour. I had a dog killed; it was cut up into thirty portions, and the thirteen dogs remaining eat their small ration with great pleasure. They had fasted for forty-eight hours, and will not eat again till after to-morrow.

Thursday, June 7th.—We set out at half-past six and travelled until noon over small level tracts and channels, covering perhaps a mile an hour; but after mid-day we find ourselves in the midst of such difficult *séracs* that we cannot advance 200 yards an hour. We work without ceasing with the ice-axes, often carry the sledges, and are breathless and worn out with fatigue.

About three, a movement of the ice opens a labyrinth of channels around us. It is impossible to continue our march, unless we go towards south-south-west, the only direction in which the ice has remained comparatively compact. We encamp upon a small level space which we have luckily been able to reach.

The sun comes out at six, and I am able at last to take an altitude. As I calculate the longitude I am overcome by a great feeling of discouragement. We are to the west of the meridian

¹ In a sledge expedition it would be advisable to make use of the same quality of pemmican for the dogs as for the men. It is only a question of a small difference in price, while, on the other hand, it would simplify very much the preparation and the daily distribution of it, and would, moreover, provide a reserve of good food for the men.

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on which we were on the first of the month, though it is only by a small amount.¹ In seven days of severe toil we have not advanced three feet to the east! What will become of us?

Friday, June 8th.—I have not closed an eye, and when in the sleeping-bag have been tormented for many hours by an intolerable feeling of anxiety. Then the thought of my betrothed, of my mother, of my duty, overcame the great depression which had fallen upon me, and I was able to reflect coolly on our situation, which is almost desperate. We have still fifty-five pounds of pemmican; when we shall have finished it, in a week, we shall yet have eight dogs, with the flesh of which we may still be able to live twenty or twenty-five days. We have thus a full month before us before we can die of hunger, and we have perhaps still time to reach Cape Flora, where the great depôt of provisions is. I decide, therefore, on going to the south; the current will enable us to drift to Harmsworth or Albert Edward Islands, which we might gain in less than a week, and thence by following the coast of Prince George Land and crossing the ice of British Channel we could reach Northbrook Island.

I much regret that I should be obliged to come to this decision, when I think of the anxiety which all my companions, and especially the Prince, will feel when they do not see us return even at the end of June. They will believe that we are lost; but I do not at present see any other way to save ourselves. We have done everything we could to rejoin the main body of the expedition, and perhaps even more than we were bound to do. It would probably have been better if I had decided on going to the south last week; but away with regrets—now I shall go to the south, and may God assist us!

¹ 3 h. 31 m. 11 s. east of Greenwich.

We are Starving. Return to the Hut 579

While we breakfast I inform my men of my decision, and I advise them not to let themselves be cast down. In seeking to prove to them that we can save ourselves I strengthen in myself the vague hope that we are not yet even at the beginning of the end. But should this be the case, I should sincerely wish that at least the two guides, who have wives and children, might be saved—I should wish that at least the tale and the result of our labours might reach Italy. And I should wish that my mother and my betrothed might read these notes and learn that I fell only after having struggled arduously until the end, and thinking of them.

At seven we set out towards the south among *séracs* ranged in almost parallel lines running from east to west; between the lines there is water which overflows still more on account of the continual movement of the ice. After an hour of perilous acrobatic exercises on the ice-floes we are obliged to go back.

To the east, there is a belt of ice broken into small pieces, on which it is impossible to go. We try to return by the way we passed yesterday, hoping that we may then be able to go round to the north of this belt, but that road, too, is closed to us. There was a great movement of the ice last night, and wide channels opened towards the north and the north-west. Being, therefore, surrounded by water on all sides, we can only wait, and I have the tent raised again, in the place where we encamped last night. The sun came out this morning and gave me a more westerly longitude than that of yesterday evening; that means that we still continue to drift.¹ At noon our latitude is $81^{\circ} 29' 2''$; if we should go down a little more to the south, we should be in Queen Victoria

¹ 3 h. 30 m. 40 s. east of Greenwich.

² $81^{\circ} 29' 13''$ N. lat.

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Sea, and certain at any rate of touching one of the islands which bound this sea to the west.

Since yesterday, Fenoillet's eyes are paining him ; they are much inflamed, and as soon as the tent is pitched I applied little discs of sulphate of zinc to the conjunctiva. Yesterday evening I had put in some cocaine. In spite of these remedies, he cannot bear the light, not even through smoked spectacles, and is obliged to bandage his eyes ; he has thus become almost blind.

We melt some snow to have water to drink, making use of dog's fat, which we put aside since the day before yesterday for the purpose. An old meat tin, with a piece of bandage folded so as to make several wicks, forms a very primitive lamp, on which our future depends. The smoke from the wicks surrounds the saucepan and deposits a layer of black on the snow ; the water coming from it is therefore blackish, with a very decided taste of fat, which is not very pleasant ; but as compensation we can drink almost as much as we like of it.

The ice opens out still more, and during the whole day we are unable to leave our position. We have in a *kayak* two legs of the last dog we killed ; we cut the flesh off one into little bits, which we throw into the pot with a little butter (of which we have still two boxes) and plenty of salt. This forms our dinner ; the meat is decidedly hard and has a sweetish taste, but we console each other by loudly declaring that it is excellent. None of us, however, finishes his share ; all that remains is collected in a mess-tin and shall be mixed to-morrow with pemmican, the rations of which I have again somewhat reduced. Suddenly the corners of the tin which serves as stove become unsoldered, the fat runs about, and we nearly set fire to the tent. Petigax, out of a sheet of tin, makes a new stove without any solder, of which I have given him

We are Starving. Return to the Hut 581

the idea. We make real wicks by unravelling a sailcloth bag ; and on the whole the new cooking-stove represents a decided advance on that inaugurated this morning.

While occupied with these petty details our minds experience a certain feeling of relief. To me, it seems that once the immediate want of provisions, and especially of fuel, is overcome, it will be less difficult to extricate ourselves from our troubles. At any rate, an hour after our meal I am no longer



IMPOSSIBLE TO TRAVEL SOUTHWARD

aware of what its quality may have been ; I do not, indeed, feel completely satisfied, but it is more than a week since that was the case, and we have gradually become accustomed to feel ourselves light, even after dinner.

I have taken an altitude,¹ very indifferently, as the sun seems to be already tired of shining for ten or twelve hours, and since four o'clock it goes in and out of its usual circle.

¹ 3 h. 32 m. 2 s. east of Greenwich.

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Since May 9th until now, I see that in general with the northerly and easterly winds we have drifted towards the south-west by about four miles a day; if we went on thus for three or four days, we should pass, according to the longitude indicated by my chronometers, near Harmsworth Island.

Saturday, June 9th.—Fenoillet has suffered all night from his eyes, which this morning are still very much inflamed. He can, however, still keep one eye open, and will be able to follow the convoy. After having made the circuit of our flat piece of ice over and over again, like lions in a cage, we perceive that we can pass the barrier of *séracs* which are to the east of our camp. The westerly wind, which has blown since midnight, has somewhat brought together the blocks of ice, and setting out towards nine o'clock, in half an hour we are unexpectedly out of this Polar marsh.

We meet more *séracs* and channels, and also some small level stretches which enabled us to advance tolerably well towards east and south-east. We cannot go to the south; it seems as though it were done on purpose; when we wanted to go to the south-east the best ice was always towards the south; and now that we have decided on going in that direction the state of the ice forces us to go towards the east. At twelve o'clock I take a meridian altitude; we are at $81^{\circ} 29'$; as we have not apparently drifted to the south, I hope that there has been no current, and that, therefore, we have not drifted either to the west.

At 2 p.m. Petigax, who had climbed to the top of a block of ice in order to look out for the best way, calls out and asks me to come to him with my binoculars. I stop the sledge and scramble up on the little hummock. Two islands high

¹ $81^{\circ} 28' 28''$ N. lat.

We are Starving. Return to the Hut 583

up on the horizon can be seen distinctly to the south-east; they must be Neale Island and Harley Island, and to their left is a high, dark cape, with its summit covered with snow. It must certainly be Cape Mill.

I remember its shape perfectly, having sketched it in my notebook as we passed before it in the *Polar Star*. Land! I think that on seeing it few sailors have ever felt the emotion which overcomes us at the present moment. Even Fenoillet and the impassible Canepa have climbed to the summit of the block, where we hold each other so that we may stand without falling. An indescribable wave of joy makes our hearts beat together. At that moment, it seems to us as though we rose again suddenly to life after an entire month of suffering, and now see that we are sure of being saved!

Our chronometers probably lost every day three or four seconds less than had been calculated, and we must be a full degree to the east of the longitude given by yesterday evening's observation.

We resume our march with incredible spirit; we feel as fresh as on the day when we left the hut; we no longer feel the weight of our legs, which till now had seemed to be of lead, nor the lightness of our stomach, nor thirst; and the convoy, instead of dragging itself along, rapidly advances among the *séracs*, which are rather difficult.

We meet a few level tracts, and in the very middle of one of them see a black object; it is a seal, which seems to be asleep. I stop the sledges and, to get near the animal, make a long circuit, hiding behind the *séracs*. But when I am about thirty yards from it, I see it move, and before I have time to level my rifle, it disappears. It had been lying on the edge of a hole, or rather a tunnel,

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of about two feet diameter, made through ice at least six feet thick, through which its body seemed hardly able to pass, and this hole was not vertical, but slanting. Even if I had fired and hit the seal, I think that it would have escaped from us in its death struggles, as it was lying too close to its place of refuge to allow us time to reach it.

Since yesterday morning the weather is extraordinarily changeable; gusts of wind or of snowdrift, sometimes slight, sometimes violent, alternate with short periods of clear sky, during which a ray of sunshine consoles us for the damp with which our clothes are saturated. These changes of the atmosphere are strangely sudden and frequent, and occur without any transition.

Shortly after three the sun lights up the horizon, which seems very clear. We climb up a hummock to have another look at the land for which we long; both the islands and the cape have disappeared; before us, towards the east, there is nothing but an immense expanse of *séracs* and channels up to where the sky seems to join the ice-pack. We are dismayed and terrified. Can what we saw an hour ago have been a hallucination? It cannot be; we saw that clear and very distinct outline, and it is impossible to suppose, as Petigax suggests, that it is a jest of the Fata Morgana. It would be too cruel and improbable a joke; neither do I wish to believe in a strong effect of refraction, which might have shown us the land still hidden below the horizon; it was too high and well defined. Perhaps, on the other hand, what is before us at this moment is a false horizon. Whatever it may be, we descend from our block of ice very much cast down, and the agony of uncertainty seems to us now more painful than our sufferings of these last weeks and the anxiety of the last few days.

We encamp at six o'clock, under a heavy fall of snow, and

make soup of dogs' flesh; we carefully take away all the fat from the meat, and I pour into the saucepan five drops of lemon juice, of which the doctor placed a small quantity in the medicine-chest of the third detachment. To-day this strange soup seems so good that we all think that there is not enough of it. To-morrow we shall increase it by a third, to the detriment, however, of our dogs, but it is better that they should suffer from hunger than ourselves. The poor animals have an incredible amount of endurance, and always draw willingly, in spite of the insufficient amount of food which is making them thinner every day.

The interior of the tent, as well as our persons, are blackened by the smoke of the fat used for cooking, but we have increased, almost doubled, the allowance of water, which is a great relief, since our burning thirst had become one of our greatest sufferings.

Contrary to our usual custom, we do not speak of the great event. I think that in our minds the conflict between doubt and hope is so great that it paralyses our power of thinking. I am so agitated that I cannot close my eyes all night.

Sunday, June 10th.—We said our Sunday prayers and then set out. We cross some small level expanses, separated by pressure-ridges and channels, which, although difficult, do not slacken very much our rate of progress, already slow, and we trend towards the east, where the ice seems to be less broken up.

Towards half-past ten Petigax signals to me from the top of a block of ice. I run to him. There is the land, there are the islands, which have reappeared more clear and distinct than yesterday. We now see well the dark rocks marked with lighter streaks, probably some sort of lichen, and crowned with snow. What I had thought was Neale Island is Cape MacClintock, which bears south-east (magnetic) from us, while Cape Mill bears east (magnetic)

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from us. Between the two capes we can make out the coast covered with snow, and some portions of rock free from snow.

There is no longer any room for doubt, and we are much nearer to land than we had thought yesterday. The angle between the two capes is thirty-five degrees; we are therefore about twenty miles from the coast, and less than fifteen from Harley Island.

It is easy to imagine how glad we are! We continue our march. The ice is terribly rugged. Petigax breaks the handle of his ice-axe, and we have now only one in good condition. We absolutely require it to make our way, and therefore try to repair the damage by binding tightly the broken handle with a very long piece of thin string. Meanwhile we make coffee, which we have not taken for several days; we have a few tablets of it remaining, and we put two (that is to say, two ounces) into as many quarts of water, and find that it gives us real Mocha coffee—strong, and most exquisite. We also chew the grounds which remain in the pot and think them excellent. It is the only advantage we derive from the privations we are undergoing.

We continue to carry on an obstinate struggle, which leaves us breathless. With these *séracs* we shall hardly do 500 yards an hour. We find a small, smooth tract, and then again *séracs*, water, and more *séracs* until seven, when we encamp.

We are quite exhausted, and even the dogs are very tired; during the last hours of the march we had to drive them on by beating them. It is true that the poor brutes have not eaten for fifty hours. We kill Ladro, and put the heart, kidney, and a leg into the pot, and find them excellent, without any effort of imagination. The well-scraped leg-bone, the head, the intestines, and the skin form the meal of the twelve surviving dogs. The remainder

We are Starving. Return to the Hut 587

of the victim is put into a *kayak*, to serve for our food to-morrow and the day after.

Using fat in the cooking-stove soils us disgracefully, but it works very well. After the meat is cooked we make a large cup of tea with the last remaining tablet, which is a little over an ounce. As in the case of the coffee, we eat the boiled leaves and think them excellent. Only Canepa thinks that it is not worth while to stir his jaws for a boiled herb. We are near land and becoming extravagant! The wind blows from the west; the temperature is $+1^{\circ}$, the weather hazy, but changes continually.

Monday, June 11th.—Yesterday evening it was very late when we went into our sleeping-bag, for cooking with fat is very slow work. This morning we have completely unloaded a sledge, which I have decided to leave behind; it is too fatiguing for two persons only to lead three sledges in the midst of the *séracs*; the guides must always go on ahead, and they have enough to do to open the way without helping us. Yesterday, Canepa and I had stiff backs. We place on the two *kayaks* the tent and the sleeping-bag, now reduced to a mere dirty carpet of reindeer-skin. The bags of down, the instruments, and the petroleum lamp are packed inside the boats, which are like wardrobes kept in great disorder. The two sledges are loaded nearly equally with 220 lb. each, or a little over, and they will be drawn by six dogs each.

This work makes us lose some time, and we only set out at 10.30 a.m., across a level stretch of ice, and through some *séracs* as difficult as those of yesterday. The sky is overcast, the atmosphere very variable, and generally hazy. When it brightens up for a moment, we see the land very well; it seems much nearer to us, although since yesterday we have hardly advanced more than four

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miles towards the east. Perhaps the ice-pack, driven by the continued west wind, is approaching the coast.

After 4 p.m. we meet with some of this year's ice, and many channels and *séracs*, which are smaller and less rugged. We are now progressing at a moderate rate, but the state of the ice and our legs does not allow us to attempt to reach land by a single forced march. Towards seven we raise our tent, promising ourselves that to-morrow we shall advance, until we feel ourselves quite safe from any surprise on the part of the ice-pack. Petigax has found five cigarettes in his wind-proof dress; they are naturally soaked, but we dry them at the fire and share them like friends.

To-day, as well as yesterday and the day before yesterday, we have seen a great many birds—several ivory gulls and very numerous flocks of little auks.

Tuesday, June 12th.—The atmosphere is hazy, and on the horizon, which is hidden by fog, there appear and disappear continually, as in a magic lantern, the very dim outlines, sometimes of Harley Island, sometimes of Cape Mill, and of the other dark rocks which form the coast. Near the island, in our direction, lies a large iceberg, which has probably grounded.¹ We direct our course towards it, and are resolved to reach it before evening. At one in the afternoon we have already marched for five hours through *séracs* and over a rather extensive tract of level ice, accomplishing five or six miles. We make a short halt, consume a tablet of coffee, and then go on again; the ice-pack now improves as we proceed: it is level, and the few obstacles we meet with are neither high nor difficult; the snow is good, and though there are many channels, they are not wide, and are easily crossed.

At 7.30 p.m. we have reached and passed the iceberg, which

¹ Very large in comparison with the icebergs to be met with in these latitudes.

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we could not approach, as it is lying in the very middle of a great oblong lake, which stretches for a mile. We follow the edge of it towards the south-east: the ice on the other side of the water seems better than that we have crossed this afternoon; and beyond the ice, not very far off, rises Harley Island, which has the shape of an enormous tortoise, perfectly white, the northern and southern extremities of which are marked by small dark rocks.

We are very much tired by the march, which would have been fatiguing under ordinary conditions, and was most fatiguing for us, weakened and worn out as we are. Even the dogs seem to have scarcely the strength to pull, though yesterday evening I had the remains of the last victim divided among them. We encamp and prepare our dinner with the still warm flesh of poor Fido, the least emaciated of our dogs.

It is ten o'clock when we finish our dinner; since six there has been a breeze from the south-east; the ice-floes of the lake have begun to move, and even the iceberg appears to be stirring. We become alarmed lest the ice-pack should become detached and leave the island—from that land for which we have been longing, and have nearly reached. If we were driven out to sea again, in the state in which we are, we should be lost, for we should be deprived of that moral energy which we may say alone supports, and has been increased a hundred-fold by the hope of being soon in a place of safety. The weakness which had overcome us disappears, and we make haste to harness the dogs again and raise our camp; and away at full speed we proceed towards the south-west to turn the lake.

Many channels which did not previously exist have already been opened. Canepa's sledge falls into one which is widening out while we are crossing; I succeed in catching it in time by the

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trace, and pull it out on the ice with the help of the guides; but Canepa cannot cross the channel, and has to make a long circuit to reach us.

The moving ice, the water which surrounds us, and the *séracs* keep us for two hours in a continual strain of feverish toil, of which we take no notice at the time as we are intensely excited by the sight of land, to which we are drawing nearer at every step, and have our attention distracted by the very obstacles we meet.

Wednesday, June 13th.—At 1.30 a.m. we are upon level and smooth ice, like the bay-ice of our island! But it is very thin, and I do not know how it will bear us. Between the ice and the slight layer of snow which covers it, there is water into which we sink at every step. We travel over this sort of marsh for about an hour, making many zig-zags to avoid those places into which it is evident we should sink. We have always water up to the ankles, and sometimes the whole leg sinks in, but we throw ourselves down very dexterously and catch hold of the sledges to avoid taking an entire bath. Little by little, the ice becomes more solid, and at last, when we strike it with the point of the ice-axe, we find that the icy crust resists. We are out of danger, but are not aware of it yet.

Towards four o'clock in the morning we can hardly drag ourselves farther, we are so weary; near us there is a slight undulation, on which the snow is less wet and not so slushy as that over which we have been walking for more than three hours. We spread the tent, throw ourselves down upon the reindeer-skin and plunge into our good bags of down. We have been marching for twenty hours, our fatigue is greater than the nervous excitement which has kept us up hitherto, and we rest.

We wake after noon, and while I am cooking the pemmican,

We are Starving. Return to the Hut 591

the men are trying as well as they can to squeeze the water out of their shoes and the sedge grass in them. Our good *kömagers* have not been able to stand the severe test of keeping out water, and are like sponges.

We are encamped nearly three miles to the west of the southern extremity of Harley Island, which is formed of large rocks of a very dark hue, and from which the outline of the island runs towards north-north-west like a great mountain of snow with



"WE TRAVEL OVER THIS SORT OF MARSH FOR ABOUT AN HOUR"

a sharp ridge, which falls on the northern side on some smaller rocks, also of a very dark colour.

We set out at 3 p.m. towards these rocks, and therefore follow the coast of the island, which in its entire length presents no salient point; the slope of the snowy mountain seems to be exceedingly steep. We walk on level ice, which stretches for some miles along the coast and is bounded towards the west by a belt of very rugged *séracs*, probably connected with those we lately

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crossed. We go on quickly, although our feet often sink into the water; the dogs, on the contrary, are hardly fatigued.

A little before six, we are at the north-west extremity of Harley Island, a tongue formed by a moraine free from snow which projects about a couple of miles into the sea. The sky is overcast, and the atmosphere very hazy; we can only make out some point on the coast at rare intervals; before us to north-north-east we have a glimpse of Ommaney Island, which we should wish to reach to-day in order to pass from it to Cape Mill or to Karl Alexander Land, according to the ice we find.

The northern coast of Harley Island stretches for about a mile and a half from west-south-west to east-north-east, and its shape bears a great resemblance to the northern coast of Prince Rudolph Island, but it is much lower and of less extent.

The belt of *séracs* which we have on our right advances like a wedge between Harley Island and Ommaney Island; in order not to leave the smooth ice, we direct our course towards the north-east, and thus avoid that mass of rugged blocks, so difficult to cross. Towards seven o'clock, we halt for a short time and then continue our march, in a thick fog which accompanies us until midnight, at which hour we are near Ommaney Island. The ice becomes more undulated, and while we are placing our feet on the slopes of the height to the south of the island, the fog lifts suddenly, and the sun, which we have not seen for several days, shines forth from the clouds as though to congratulate us.

Thursday, June 14th.—We cross the island to its western coast; it has the shape of a great horseshoe open to the west, and the gentle slopes, which form the two ends, stretch out towards north-north-west and south-south-west, while the eastern part of the island is steep and falls almost perpendicularly.

We are Starving. Return to the Hut 593

Properly speaking, Ommaney Island is formed by two islands joined by a little isthmus on the eastern side; on that side they rise in two helmet-shaped heights with flat, truncated summits. We encamped about 1.30 a.m. on the slope of that towards the north, on a soft layer of dry snow. I ascend to the top of the height, which is about 180 feet above the level of the sea, where there is a fine terrace of stone and mud quite free from snow, and we experience an infantine pleasure in touching the earth.

The fog has now quite cleared away; we see Cape Mill to the east, Karl Alexander Land to the north-east, and in that direction the ice seems to be smooth and to offer no obstacle; towards south-south-east, a little to the south of the bearing of Cape MacClintock, is Neale Island, which on the English map No. 2282 (1899) is placed more to the west than the position which it holds with regard to Harley and Ommaney Islands.¹

When we got back to the tent, we had an ample meal of dogs' flesh, and then lay down very well pleased. It is now eighty-five days ago that we slept on solid ground, not subjected to the caprice of the winds and currents, and not fearing the pressure of the enormous mass of the frozen ocean!

When we awake the ice to the north-east seems to be a little changed; at half a mile from the island are to be seen several channels, in the neighbourhood of some small icebergs, near which, I had remarked in the morning, the ice was compact. To the

¹ I had already formed doubts as to the situation of Neale Island when, on arriving at Harley Island from the north-west, I had not succeeded in sighting it, and so was forced to suppose it was much more to the south or that it was hidden by Harley Island. Afterwards, when we passed near these islands on our return journey on board the *Polar Star*, I had the opportunity of verifying that, in fact, Neale Island bears nearly south-east from Harley Island, as indeed Nansen has marked on his map.

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east there is much water and some new ice which is moving; to the north and to the north-west there is a belt of *séracs* of which we cannot see the end.

At noon, however, we set out, trusting to be able to make our way towards the north-east; but after spending more than two hours in attempting to advance, we are obliged to return. We then try to pass through the *séracs* to the north; for about an hour we progress inch by inch, and then, surrounded by ice pressures and unable to go farther, we are forced to go back again to the island, which it takes us five hours of indescribable toil to reach. It is 7 p.m. when we again encamp to the north of Ommaney Island, exhausted and despondent. We are soaked up to the knees, and Petigax, who has had two complete baths, is obliged to change all his clothes. Since two o'clock this morning the sun has been hidden, and there is now a fall of fine and soft snow, which wets like rain.

Since noon we have not seen land in any direction. We get into our sleeping-bags, vexed by the unfortunate result of our day's work, on which I had founded great hopes of being able to approach, if not reach, the coast of the larger islands.

Friday, June 15th.—We passed a sleepless night, and when we rose we waited several hours for a favourable movement of the ice; there is nothing else to do, after our fruitless and dangerous attempts of yesterday. Fenoillet, when asked for his opinion, suggests that we should abandon all our equipment, and try to reach Prince Rudolph Island with the small quantity of pemmican still remaining, followed by the dogs. It would be a desperate attempt; I like the boldness of it, but I think it is premature.

From the summit of the island we see a great deal of

water on all sides, and the ice is continually moving. About 2 p.m. it becomes fine and bright, and we clearly make out Cape Brorok, and Cape Germania which resembles a small isolated rock. The sight of them is perhaps a fresh encouragement to recommence the struggle against the obstacles which hinder us from reaching our comrades. The channels to the north-east seem to be wider than yesterday; but, nevertheless, I give the order to set out. After many turnings and windings, perilous jumps, and unheard-of efforts in the midst of ice pressures, passing over nicely balanced blocks of ice which turn upside down when we have crossed them, we succeed in getting through the line of icebergs where the ice is worst, and advancing more than a mile to the north-east of the island. Our progress is completely stopped by a wide channel, but it seems to us that now the greater part of our work is done, and we wait till the pressure of the ice shall close it up. Meanwhile we dine off a leg and a shoulder of Salvato's, and to take the taste of fat from our mouths, we drink a glass of warm water, in which we have let fall a drop of milk which had remained at the bottom of a tin.

A lake opens out behind us, like the open sea. If we had waited half an hour longer, we could not have reached this ice, which, bad as it is, offers us at least a way to escape quickly; if it does not fall to pieces, we may be at the hut in a week at most.

Ten days ago, we thought we were in a very much more difficult situation. We all fall asleep in good humour.

Saturday, June 16th.—The channel closes up at 2 a.m. We jump up, and in a few minutes are travelling over the moving ice, and by ways over which, a month ago, we would never have thought that we should be able to pass by ourselves, and still less

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with the sledges and the dogs. We are, naturally, up to our legs in water every moment, but now we think no more of it; we only begin to perceive that we are wet when we sink to the waist.

At 5 a.m. we are fully two miles from Ommaney Island, and beyond the greater part of the channels. We still meet some *séracs* and small channels, but we extricate ourselves from them without losing much time. It is, however, excessively fatiguing for the guides who are working ahead of us, and for us who have to make the sledges go on. The dogs, which have been fasting since the day before yesterday, do their best, but they require to be continually helped, both on the snow and in passing through the ridges, where the sledges catch both in front and on the sides; mine has to-day a special tendency to overturn; it must have fallen forty times at the very least; there are moments when I am utterly exhausted, and when I envy the dogs.

While we are executing a difficult crossing, Canepa, who is holding back his sledge, slips and falls with it into the sea, taking a complete bath up to his nose. Luckily the sledge sinks slowly, thanks to the *kayak*, and we are in time to seize it by the trace and drag it up on the ice. The *kayak* is full of water; it contains the sleeping-bags of down, which (being tightly rolled up in the reindeer-skin) are fortunately dry, and our small store of pemmican, which will certainly not have time to grow mouldy. We put up the tent to allow Canepa to change his clothes, and meanwhile let the water drain out of the *kayak* and baggage. After an hour we continue our march.

We go towards east-north-east, as towards the north the ice presents many difficulties, and advance at a moderate rate, but still with much fatigue, until 2.30 p.m., when we are stopped by a

channel. We cannot follow it towards the north, on account of the *séracs* in that direction, and it does not suit us to go down towards the south; besides, we are exceedingly tired, so we encamp.

We sacrifice my personal friend Grasso (Fatty), because he is still worthy of his name; his flesh is plentiful and good. This dog, presented to us by Nansen at Christiania, was born on the *Fram* in the 85th degree of latitude, and could not end his very useful existence in a more worthy manner. We are again enveloped in fog, and a stiff breeze blows from the south-east; let us hope it may not drive the ice away from land!

Sunday, June 17th.—At midnight the fog lifted completely for a short time. I take an observation for latitude, which gives $81^{\circ} 25' 1''$; the bearing of Cape Mill is 170° , of Ommaney Island 225° , and of Leigh Smith Island 80° (all magnetic). We said our prayers quickly, and then lost all the morning on account of the channel which stopped us yesterday evening. We get over it only at eleven, and then cross several small level tracts, separated by pressure-ridges and channels which we pass with reckless daring. Sometimes we carry the sledges on our shoulders, or throw them deliberately into the water and then pull them out by the traces.

While crossing over a pressure-ridge which forms the bank of a channel, a block of ice on which the guides are working becomes detached, and falls into the water, dragging along with it Petigax, who stops half-way as though by a miracle, by seizing a projecting piece of ice, and we come just in time to rescue him from a bath.

At 5 p.m. we are on the edge of a lake, which the movement of the ice is enlarging. We have had more than thirteen hours of

$181^{\circ} 24' 58''$ N. lat.

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continuous and very fatiguing work, and pitch our camp most willingly.

Cape Mill bears south (magnetic) from us, and Cape McClintock is almost shut in with Cape Mill. The bearing of the southern point of Karl Alexander Land is 85°, and Cape Brorok is quite visible. We have, therefore, made a certain amount of progress.

This evening we have again dined off Grasso's flesh, and we keep a leg and a shoulder for to-morrow; we have still nine dogs, and must make them last as long as we can, for the pemmican, too, is running short. We have nineteen pounds of it. As the fog lifts, a ray of sunshine lights up the Middendorf Glacier, and we see distinctly the outline of the upper part of Prince Rudolph Island.

Monday, June 18th.—During the night the lake has become narrower, especially to the north, and at five o'clock we set out to turn it in that direction. We meet numbers of channels, *séracs*, and some insignificant plains of ice; in spite of that we go on, and Karl Alexander Land and Cape Brorok appear more and more distinctly. The sun has reappeared, and the sky is at last unclouded. The wind is blowing freshly from south-south-east, and fearing that it might drive us out to sea, we trend towards the east-north-east, as much as the ice will allow us, so as to approach the coast as soon as possible.

We halt at eleven and have lunch, which has been suppressed for several days. Our last tablet of coffee but one (weighing an ounce), a tablet of sugar (also one ounce), and an ounce and three-quarters of butter in about two pints and a half of water compose a drink which we found excellent and very strengthening.

At noon I find that our latitude is 81° 30',¹ the bearing of

¹ 81° 29' 25" N. lat.

We are Starving. Return to the Hut 599

Hohenlohe Island is 50° , of Cape Mill 182° (all magnetic), and we continue our march full of enthusiasm.

Towards 3.30 p.m., while it appears to us that we see to the east some ice much better than that we are crossing, we become entangled in a regular marsh of ice-floes, in which we are very nearly lost. We passed a lively time balancing ourselves on ice-floes, which were turning upside down and sinking under our feet; we often had to stretch out our ropes to drag the sledges from a distance over a puddle of small pieces of ice which could not support the men, whilst the men had to make long circuits to pass where the sledges could not go. It was not possible to retrace our steps, as the passages of the sledges had broken up the floes, and water was pouring over them. If the very slightest ice pressure had taken place at that moment, we could only have closed our eyes and said "Amen!"

When we came to a small tract of level ice, on which we afterwards encamped, we looked each other in the face and all had the same thought—that we had escaped from the greatest danger we had run during the expedition. Ahead of us to the north there extend many *séracs*; to the east there are water and ice-floes, and along the coast of Karl Alexander Land a wide channel has been opened, which seems to reach a little beyond Cape Felder. If it is not longer than that, we may touch land at Cape Brorok, from which we are about ten miles distant. It is indeed time that our woes ended!

Tuesday, June 19th.—During the night we hear a continuous sound, like that of waves breaking on the beach. I come out of the tent several times to ascertain what may be the cause; it comes from far away—from the south and south-east, and I suppose it must be caused by the ice-floes set in motion by the wind. It is

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now blowing rather freshly from south-east, and I cannot close my eyes with the thought of being driven out to sea in the direction of the west, towards death.

In spite of all our economy, our pemmican will be quite ended on Saturday, and we shall have only six dogs and the salt remaining. Neither shall we have any vessels. The pot we are using is nearly worn out, and leaking on all sides; we expect to see the bottom, which we fixed to it a month ago, come off at any moment, and have no means of mending it. The small pot cannot be put on the fire, as two weeks ago it was hopelessly burnt; we have stanchd it with wax, and it serves as a vessel into which to pour cold water, for as we melt the snow in the large pot or in the aluminium dishes, which are also leaking, we must make haste to pour out the water from them, lest it should put out the fire. This operation can give an idea of the difficulties and complications which we have to surmount in order to be able to drink and to cook our wretched meals. These troubles increase every day, causing great loss of time, and rendering our existence more and more difficult.

I frequently rise to verify some angles I have taken between salient points on the coast; we are not going away from it perceptibly, and that is a great relief.

We set out very early, and for three hours are struggling in the midst of *séracs* and water; and then towards 7 a.m. we unexpectedly see before us several fine level plains of ice in the direction of Cape Germania, towards which we have been trending since this morning, as the channel along Karl Alexander Land has become still wider. About noon it lengthens out up to Cape Brorok, and is from two to three miles wide. We hope to be able to turn this arm of the sea by the north before it extends along the coast

We are Starving. Return to the Hut 601

of Prince Rudolph Island, and hasten the pace of the convoy across the ice, which is here smooth, and almost without obstacle. But shortly after mid-day¹ we are again in the midst of water, and, in spite of all our efforts, cannot go on. At five o'clock we pitch our tent on a small level tract of firm ice, which we can hardly believe we have found, and where we can rest quietly.



"WE UNEXPECTEDLY SEE . . . SEVERAL FINE LEVEL PLAINS OF ICE"

During our march we have seen the tracks of a very large bear trending towards the north-west.

The south-east wind fell at last towards 8 p.m ; the arm of the sea running along the coast has become narrower ; it has been reduced to a thin line of water, and the curious noise of waves breaking, which we have heard for two days, has ceased. There is a fall of fine and minute snow, which seems like rain.

¹ 81° 29' 57' N. lat.

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Wednesday, June 20th.—While we were asleep a very light westerly breeze broke up the ice, and when we awake we see the level spot on which we are encamped quite surrounded by water. Here we are imprisoned, on a little island, almost circular in form and of about sixty yards in diameter, and must await the whim of the wind or of the tide.

The state of the ice which surrounds us has changed very much; to the west, the north-west, and the north is the ice-pack, rugged and bristling with pinnacles, but solid; we do not see any of those belts of ice which are so dangerous and difficult to cross in it; to the east, between Karl Alexander Land, which we are near, and Cape Brorok, there is much water and broken ice; to the south and south-west there is open water.

We pass the day in continual alternatives of hope and despair; our little island sometimes draws near to the pack, which is at this moment the object of all our desires, and sometimes goes away from it, but it is never given to us to reach it. A westerly wind sets in, and blows in gusts which are growing stronger. We place much confidence in it.

The extent of open water began to diminish after 4 p.m.; it is now invaded by a multitude of ice-floes coming from the south, but we are still isolated. If this state of things lasts till to-morrow, we shall begin to put the *kayaks* in order, and it will take at least three days' work to render them fit for use. It is probable that when these fragile skiffs are ready, and we have killed all our dogs to make pemmican with their flesh, these watercourses will close up and the ice-pack be in an excellent condition for the sledges.

This evening the ring which supports the pot has gone to the bad; it melted while we were cooking the meat, which we had to eat half raw, and we had to give up drinking the glass

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of tepid water with which we enjoyed the luxury of freeing our mouths from the disagreeable taste of grease.

These perpetually increasing misfortunes, great and small, would break down anybody's strength and wear out the patience of Job! And in a thoroughly impatient state of mind we throw ourselves down on the reindeer-skin, wrapped up in our sleeping-bags.

Thursday, June 21st.—Last night, as has already sometimes occurred to me in these last few days when in a state of nervous, I might almost say hungry, insomnia, there came to my mind facts and details and episodes of my past life of no importance—past events that seemed to me I had heard of or done but a few hours previously; a strange lucidity with regard to matters that I thought I had forgotten—perhaps that lucidity of mind which is said to come to the dying. Am I, indeed, in that situation? Or is it the dread of the gloomy future which evokes the past so distinctly? And this state of half sleeping, half waking, is interwoven with dreams which always wind up by a dish of stewed meat, or a cutlet, or a *risotto*. And yet, although I feel light and weak, and though I have grown excessively thin, I do not perceive that I am suffering from hunger.

One or other of us remained outside the tent all night; the expanse of water sometimes widened out and sometimes grew narrower. We were for some hours about twenty yards from the ice-pack; some ice-floes, to which in our despair we would have trusted ourselves in order to get across, passed near, but we could not seize them. At 4 a.m. this morning we were less than two miles from the north-west point of Karl Alexander Land.

The wind shifts to south-west, and at five we are at the opening of the channel between that land and Prince Rudolph Island. I hardly dare to believe that the wind will drive us into it, and

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am astounded when I hear Fenoillet, who is our chief pessimist, express the hope that we shall drift to Hohenlohe Island. We are enveloped in fog, and can no longer see anything.

At 8 a.m. we empty a *kayak*, take it from the sledge, and bravely set about mending it. It is the least damaged of the two, but it has a couple of ribs broken, and the canvas is torn on the sides, very near the bottom, in three places.

Petigax mends the ribs with the cross-bars of a sledge. Fenoillet, Canepa, and I begin to patch the canvas; to make the seams water-tight, we put pieces both inside and out, and spread dogs' fat between them. The work takes much time; at 3 p.m., though we never stopped working, we have succeeded in mending only one side of the boat. When the fog lifts for a short time at rare intervals, we get a glimpse of a black rock on Karl Alexander Land. I frequently take its bearings with the compass in some anxiety. We are moving towards the north-east.¹

Towards 4 p.m. there comes up close to our island from the east a large sheet of ice very much broken, but we can see that some parts of it are level. We collect our baggage in a few minutes, and try to cross over to this ice, which, although it does not look very promising, will rescue us from our intolerable imprisonment, and, if nothing else, will at least take us out of our inaction. We push resolutely and desperately forward; after struggling for an hour, with the utmost anxiety, on broken ice and in the midst of water, we are hardly fifty yards from our island, but at least we can breathe on an ice-pack which seems to reach to the coast.

The ice is better than it seemed from far away; there are many flat expanses, across which we quickly approach Karl Alexander Island, the nearest land, and advance feeling very uneasy lest we

¹ Latitude observed at noon: 81° 33' 33" N. lat.

We are Starving. Return to the Hut 605

should not reach it. At every place where the surface of the ice rises, I look forward anxiously to see if no dangerous channel cuts our way. I often ask the guides, who march in front, for information, and they answer: "There is not much water, and the way is good." Suddenly they call out: "Quick! quick! A channel is opening." We rush forward with the sledges, but the channel is already several yards wide; we jump without hesitation on ice-floes to gain the opposite shore, but when we are half-way across the channel, which still continues to widen rapidly, the ice-pack before us begins to move in a southerly direction; all the ice-floes break up, and we remain isolated upon a thin floe of recent formation, not more than twenty-five or thirty feet in length and breadth. We immediately say to each other: "We have fallen out of the frying-pan into the fire!"

The ice-field we have left also begins to move towards the south, and that which we wished to reach acquires great speed in the same direction. Our ice-floe and those around it (probably because they draw little water and the current, which is the cause of all the movement, has but little power over them) remain steady or move slowly towards the north, driven by the south-west wind, which is blowing strongly. The channel in which we are has become a lake, which is lengthening out more and more towards the north.

It is not to our interest to allow ourselves to be carried away to the south, out to sea and far from land, and the thought comes to us, instinctively more than by reasoning, to take advantage of the wind to push on towards the north. We take out the sails of the *kayaks* and attach them to a bamboo tent pole; the oars serve as masts, and with this improvised sail we have done in the twinkling of an eye all that is in our power to do to struggle

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against the danger which threatens us. We have taken a bearing on land and joyfully perceive that, while the two ice-fields go swiftly on their way, we do not drift towards the south; all the other ice-floes, on the contrary, follow the chief part of the ice-pack.

Our strange system of navigation had lasted for about two hours, when we saw the lake suddenly close up before us and the ice-pack come down upon us with great speed. We fling down sails and mast as well as we can on a *kayak*, and make ready to pass on to the ice-pack before our wretched little island can receive the shock. We lose no time. As soon as the large floe is near us, we jump upon it, dragging after us the dogs and the sledges, and at the same moment the feeble support which had carried us until then falls into fragments, crushed between the ice-pack and the surrounding floes. We turned round, astounded, and caressed our good dogs, which had been so obedient to our word of command and so plucky! If they had hesitated for a moment we should have lost the little that remained to us of our equipment.

When the momentary emotion, which we four felt more or less strongly, had passed away, we set out again, running as fast as we can to Cape Böhm. The ice-field has suddenly stopped, perhaps because it has struck against some projection on the coast. Before us there are several level stretches, and some rows of *séracs*, which we cross by lifting the sledges and dragging them with all our might so as to go quickly. Then we are upon flat ice, which must be fixed to the coast, but we continue to run, out of breath and panting, without stopping until we are quite under the cape, at about a hundred yards from the rock.

It is 10.30 p.m., and as soon as we stop we all sit down on the *kayaks*. This day's violent emotions, and the rate at which we have just run, have exhausted us. We spread the tent; we

"WHICH WE CROSS BY LIFTING THE SLEDGES AND DRAGGING THEM WITH ALL OUR MIGHT"



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eat our meat almost raw, and throw ourselves into the sleeping-bag. Our tent is pitched upon wet snow, and the cloth on which we are stretched is soaked with water, but we do not care to look about for another place, and fall fast asleep without fearing any disagreeable surprise, without uneasiness for the morrow, and with our minds at last tranquil after a long period of agitation.

Friday, June 22nd.—I had said that we should rise at ten, but at eight we are already on foot, impatient and anxious to start. Above our heads towers the very sharply pointed sugar-loaf, about 900 feet high, which forms the northern outline of Cape Böhm. It is a bare rock, with vertical, reddish streaks, and inhabited by hundreds of birds. The two other capes, which jut out to the north-west of the island, bear south-west (magnetic) from us; they, too, are of a very dark colour, and are also remarkable for their height.

While Petigax and I are making soup with dogs' flesh, Fenoillet and Canepa go with the gun to shoot birds. We would wish to give some to our poor dogs, which, for their sole meal, are gnawing the remains of the reindeer-skin we have abandoned to their hunger. But our men soon come back with empty hands; a large crevasse prevented them from reaching the rock.

At half-past eleven we set out towards the north (magnetic)—that is to say, for Cape Brorok. The weather is very hazy, but when it cleared for a time, we saw that the ice in that direction is level, compact, and joined to the land apparently. There are frequent gusts with snowdrift, we have half an hour of pale sunshine, and then snowdrift during the whole day, sometimes slight, and sometimes very thick. As we cannot see the promised land, we are obliged almost always to advance with the help of the compass.

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The snow is wet, which is very bad for dragging the sledges, as it sticks to the runners and tires our dogs exceedingly. We have still seven, but only three really pull (three to each sledge), for Messicano is at the last extremity, and can hardly hold up the trace. Canepa and I often harness ourselves to help them, although we, too, find much difficulty in walking, and often sink up to our knees.

About 7 p.m. it clears up, and we can distinctly see Cape Habermann and Cape Brorok quite near to us. Then not only does a very thick fog come on, but snow also falls abundantly, so that we cannot see fifty yards before us. We stop to rest and to take our last piece of pemmican, hoping that in the meantime the atmosphere will become clear. We go on again at half-past one; the fog is still thick and it continues to snow. We hear a noise in the distance, like the creaking caused by a pressure among the ice-floes. We feel rather uneasy, but afterwards perceived that it was caused by the cries of birds.

At eleven the fog lifts unexpectedly, and again reveals Cape Habermann and Cape Brorok. We think we have already arrived, but must still go on until half an hour past midnight, to reach the side of the steep rock which stretches between the two promontories.

The whole of the very precipitous declivity, from the top down to the sea, is covered with birds. There are thousands and thousands of little auks, noisy and vivacious, which, with their loud cries, had made us fear a movement of the ice.

Saturday, June 23rd.—We stopped for about ten minutes, full of emotion; we are at last on Prince Rudolph Island, a few miles from the hut, from our comrades.

We continue our march, skirting towards the west the steep



Capt. Pelias, Kennell and Casper, June 23, 1900

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coast, the summit of which is bordered with many helmet-shaped projections, rising in the midst of pinnacles like small Saracen castles. We turn an enormous rock, which marks, I believe, the basis of the angle forming Cape Brorok, and then trending slightly to the north-west, we continue to follow the coast-line of the island up to the promontory which I think is Cape Auk. Here the rock ceases; the glacier comes forward like a spur, its outline shows a steep declivity, and it is broken off sharply at the edge of the sea, where there is a fall of fifteen or eighteen feet.

To reach Teplitz Bay we ought now to return to the ice-pack, which seems to be very rugged and intersected by lanes and pools. I prefer to cross the spur of the glacier; we have all to unite our strength to ascend it, as the sledges tend to slip down the steep incline towards the point where it falls into the sea. Petigax and I harness ourselves to one sledge, Fenoillet and Canepa to the other, and in little more than half an hour we have got over the most difficult part of the ascent. There are crevasses, into one of which Petigax narrowly escaped falling while leading the dogs.

The two guides rope themselves together, and go forward; Canepa and I are able to follow, each of us helping to pull his sledge. When we reach the summit, we are again enveloped in fog, which is so thick that we cannot go on without serious danger. A few steps from us is a rock jutting out from the ice; we raise the tent against it. It is 6 a.m. We give the dogs what remains of the bones of the last victim—bones which have been already well scraped for our own meal.

At eight o'clock the fog lifts, and Fenoillet, who is outside the tent, cries out: "The hut!" We all hasten to look at it. We seem as though we had fever! Our hands tremble while rolling

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up the tent, and still more while fixing the flag to a bamboo, which we tie to a *kayak*. We wish to arrive with our flag flying, in order that our comrades will draw the conclusion that we are all in good health, and do not return defeated.

We descend the glacier, which is full of crevasses. The *Polar Star* is still fixed in its place; we begin to see black spots moving about, and hasten on. Now we can already make out the men. Suddenly I see with my binoculars that they are all running; I understand that they have seen us. Our agitation increases as we continue to descend; our comrades are now on their way to meet us. They are few in number, and I vainly try to reckon them; at that moment fear that the second detachment may have been lost comes to me forcibly; we are now very near, and all try to perceive the doctor, but do not succeed. And yet he is there at the head of the men and waving his cap like them, and crying out: "Hurrah! Hurrah! Hurrah!" A few minutes later we are in each other's arms. I clasp the hands of the men; Hans says to me: "Do you know Querini has not come back?" I look at Cavalli as though stupefied; he bows down his head.

Approximate co-ordinates of the points from which the first and second detachments were sent back to the south:—

First detachment: latitude $82^{\circ} 32'$ N.; longitude 3 h. 56 m. 40 s. east of Greenwich.

Second detachment: latitude $83^{\circ} 16'$ N.; longitude 4 h. 0 m. 40 s. east of Greenwich.

METHOD ADOPTED
IN THE
CONSTRUCTION OF MAPS



FR



NORTHBROOK ISLAND, SEEN FROM DE BRUYNE SOUND

METHOD ADOPTED IN THE CONSTRUCTION OF MAPS

MAP OF EMPEROR FRANZ JOSEF ARCHIPELAGO

IN the preparation of the map of Emperor Franz Josef Archipelago, recourse was chiefly had to Jackson's map, which he had constructed by making use of the bearings taken by himself, as well as of those taken by Leigh Smith, Payer (corrected by Copeland), and Nansen.

The recent discoveries of Wellman have also been inserted in the eastern part of the archipelago, and finally the modifications derived from the expedition of the *Polar Star*.

As the longitude of Cape Flora proves to be $27^{\circ} 30''$ more to the east than is marked on Jackson's map, all that portion of the archipelago which Jackson drew up, by making use of the bearings taken by himself and of those taken by Leigh Smith, has been shifted towards the east by that amount.

The part thus displaced comprises Alexandra Land, Northbrook Island, and the neighbouring islands as far as Salisbury Island (inclusively) to the north, and as far as the western coast of Hall Island to the east.

As the eastern part of the archipelago (drawn by Payer and corrected by Copeland) has been kept in its position, and as the western part, on the other hand, has been displaced towards the east, it has been necessary to slightly change the form of some of

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the islands, in order to preserve the channels and straits and prevent some of the lands from overlapping. Thus Zichy Land has been diminished on the eastern side, and MacClintock Island and Hall Island have likewise been reduced in size.

The eastern portion has been modified and augmented (as Copeland had drawn it) according to the bearings taken by Wellman. Wilczek Land has thus taken a different shape, and its coast-line has been completed. Graham Land, Whitney Island, and other smaller islands discovered by Wellman have been added. Finally, also with the help of the map which he published, the coast-line of Hall Island has been slightly changed, and new islands added in Aberdare Channel and Markham Sound.

The northern part of the archipelago has been treated in the following manner :—

PRINCE RUDOLPH ISLAND.—The coast-line of the island from Cape Auk to Cape Rath, passing by Cape Fligely, has been drawn by making use of bearings taken during the *Polar Star* expedition.

The southern part was determined as follows :—

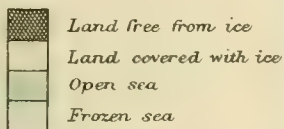
Cape Brorok, by means of the latitude given by Payer (Copeland), and the bearings taken from Cape Auk during our stay at Teplitz Bay. Cape Habermann, by means of a bearing taken from Cape Brorok.

WHITE LAND.—This has been put in the place given it by Jackson, who located it according to the data with which Nansen had furnished him.

The bearings of the northern and southern extremities of this group of islands discovered by Nansen, taken from Cape Fligely, would place White Land a little more to the south than Nansen's estimate. (True bearings taken from Cape Fligely, 107° and 131° .)

TEPLITZ BAY

Scale of 1:49 500.



The heights are given in feet

QUEEN VICTORIA SEA

C. Säule

118

255

133

57

147

54

The Hut

Stella Polare

820

Winter Quarters
of the
STELLA POLARE
Scale of 1:10000.

The Hut
Hut for the
Magnetic Instruments
A Pole for
landmark
The Ship

C. Auk

587

Method adopted in Construction of Maps 617

KARL ALEXANDER ISLAND.—Cape Felder and Cape Brogger were put in their places by means of the intersection of the bearings taken from our hut (Teplitz Bay), and of those of the same capes taken by Payer when encamped at Brorok (see Copeland).

The cape to the north of this island (Cape Böhm) was fixed by the intersection of two bearings—the first taken from Teplitz Bay, and the other, in the opposite direction, from Cape Felder, by Commander Cagni.

For the rest of the coast-line of the island, Nansen's map has been followed as much as possible. The group of small islands (Torup, Coburg, etc.) situated to the north-west of Karl Alexander Island have been also placed according to the same map.

FREDERICK JACKSON ISLAND.—Nansen's hut is situated here. From his map, therefore, have been taken the geographic co-ordinates which he gives us of his hut, and $27^{\circ} 30''$ have been added to the longitude (the difference between the longitudes assigned to Cape Flora), because Nansen made the calculations for the correction of his chronometers at Cape Flora, making use of the longitude which Jackson gave of it, which we consider to be $27^{\circ} 30''$ in error.

By means of these co-ordinates, the position of Nansen's hut has been fixed on the new map, and in relation to it all Frederick Jackson Island, taking its dimensions and form from Nansen's map. Thus, the position of Cape Mill nearly agrees with the bearings taken from our hut.

Ommaney Island was put in its place by means of the latitude calculated by Commander Cagni, and the bearings taken by Nansen from the hut where he passed the winter.

Neale Island and Harley Island were also placed according to the bearings taken by Nansen.

Finally, Marie Elizabeth Island was put in its place by means

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of the latitude derived from Jackson's map and the bearings which Nansen took from his hut.

The islands situated farther to the north-east (John Hay Island, Jessup Island, etc.), given on Wellman's map, have been excluded, and Petermann Land and King Oscar Land, given on Payer's map, also, as they have been proved not to exist.

THE FROZEN ARCTIC SEA

The limits of the ice in the Atlantic Ocean and in Barentz Sea have been indicated by making use of data derived from G. Garde for the months of July and August, and given in his publication, "The State of the Ice in the Waters East and West of Greenland, 1899" (*Nautical Meteorological Annual of the Danish Meteorological Institute*, Copenhagen), and of the observations taken on board the *Polar Star*. The open water to the north of Siberia and America has been indicated by making use of the observations taken during the voyages of Nansen, Nordenskiöld, Collinson, MacClure, Franklin, and Parry.

The various maps were drawn up by the Royal Hydrographical Institute of Genoa, and printed for the Italian edition by the Institute of Graphic Art at Bergamo.

REPORT
OF
DR. ACHILLE CAVALLI MOLINELLI
ON HIS JOURNEY WITH SLEDGES WHILE RETURNING FROM
THE LATITUDE OF $83^{\circ} 16'$ TO TEPLITZ BAY

*THE RETURN OF THE SECOND DETACHMENT FROM THE
LATITUDE OF 83° 16' TO TEPLITZ BAY*

FRIDAY, March 30th.—Commander Cagni has decided to go on with three men, and to send back the second detachment some days sooner than intended, in order to save the provisions required for the additional man whom he will take with him. I shall return to-morrow, with the guide Savoie and the sailor Cardenti.

This is the last day which we all spend together ; to-morrow the convoy will be obliged to reduce its number again, and to divide itself into two detachments, each of which will have a different object and will proceed in a contrary direction. We shall go to the south, to rejoin our winter camp, whilst the others will go on towards the north, to face fresh dangers and hardships, and attempt to discover the mystery which is the goal and object of our expedition. We regret to see this moment draw near, and the joyfulness of our return does not compensate for the sadness of the parting. We began the struggle together, and we should wish to carry it on together till the end. The immensity of the solitude, our isolation, and our labours have united us like brothers, or better still, welded us together like a single mass, in which each individual has his special function necessary for the proper working of the entire body ; and our small contribution of labour seems to us to be not only an aid to our companions, but also a useful element for the success of the expedition. This is the last stage

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made by my detachment towards the Pole, and this evening, in sign of rejoicing, we hoist our little tricoloured flags on the two highest hummocks.

It had been decided between us, that my detachment should return with three sledges, twenty-four dogs, and fifty-four full rations for the men—that is to say, provisions for eighteen days, and 200 lb. of pemmican for the dogs. A part of this pemmican could also serve for the men. I had, moreover, two *kayaks*, but I thought that one only would be enough to take with me. As I should reach Teplitz Bay in the month of April, when the temperature is still very low and the sea entirely closed, and as it would be impossible to make use of the *kayaks*, I thought it better to do without a useless weight. One would be quite enough in case I should want, when near the island, to send the sailor ashore to ask for a boat. I kept that which was in the better condition ; the other was taken to pieces, and divided between the two detachments to mend the sledges.

Saturday, March 31st.—We were all on foot this morning at seven, and busied ourselves with the final preparations ; we shared the dogs between us—the sledges had been already got ready—breakfasted, and at ten both detachments were ready to start. Commander Cagni had given me my instructions for the return. He wrote a letter for His Royal Highness (in my note-book), in which he briefly described the state of the expedition, the distance it had accomplished, and the improvement it had found in the state of the ice during the last few days ; lastly, he expressed the hope he still entertained of being able to push on far towards the north. He told me to expect him towards the end of May, or in the first days of June, and to begin from May 25th to look out for his return. We embraced each other, visibly affected, and,



SHARP WEATHER !

The Return of the Second Detachment 625

without exchanging many words, took leave of our comrades ; wishing each other mutual good luck, we separated. Petigax and Fenoillet went first with a sledge, whilst the five others at a short distance followed them, together with Canepa and Cagni. As they went away, we ascended the highest heap of ice, and, waving our flag, wished them once more a happy journey. We stood there in silence, accompanying them with our hearts and eyes, until they disappeared on that white and boundless plain.

We then collected our few appurtenances, and set out on our return. We have three sledges, each drawn by eight dogs, lightly loaded. The track has been made, and we shall go on well. We had not travelled very far on March 29th and 30th, and by making a slight effort we can get over a good deal of what we had covered on the 28th, and thus save a few days at the outset. During the first stages of our journey, it will be easy to gain something on the entire distance, as we shall be able to follow the tracks of the previous days, which we must afterwards abandon in order not to deviate too far from our route. Bad weather must also be taken into account in our estimates ; moreover, the ice is excessively rugged in the neighbourhood of land, so it is necessary to take advantage of the first days. On calculating, minutely, every contingency, I persuade myself that I shall reach Prince Rudolph Island in less than fifteen days.

The dogs set out on their old tracks ; they run smartly, and we have some trouble to keep up with them, though every now and then we rest by getting on the sledges.

Though the temperature was -40° , we were already perspiring after an hour's march, and had to make a short halt to take off some of our clothes. We took off our heavy *anorakers*, and attached the *finskos* better to our feet. Being more lightly clothed and very

well shod, the path vanished quickly beneath our feet; at one o'clock we were already at the site of our encampment of the 29th, and at five at that of the 28th. A deep, hollow sound, like that of a distant train, rises from the plain of ice; it is the groaning of the ice under the stress of pressure, and the premonitory symptom of the coming upheaval which will change the lines of the landscape; it is the beginning of the ruthless and eternal struggle of the larger piece which crushes and grinds the smaller and weaker, reducing it to a thousand splinters. Some lanes which had opened have already disappeared; others are closing rapidly; their edges join together with a loud crash and rise up, overlapping each other, and slowly form ridges. We are in a spot round which the ice is everywhere broken, cut up, and intersected by numerous lanes. If there were a strong pressure, it would offer little resistance, and would probably be the point which would be most broken up. It is not prudent to stay there longer. By driving on the dogs and pushing the sledges, we succeed, not without a good deal of labour, in crossing the ridges, which creak and moan while they rise under our feet, and reaching a place of safety. Collarino, one of our dogs, more timorous than the others and afraid to risk itself among these moving blocks, contrives during this crossing to free itself from its harness, and to run away; though often called, it cannot decide on coming over. It will return later. We travel over a portion of our track of the 28th, and at six o'clock, being tired, we look for a place suited for encamping. A heap of old ice offers excellent shelter, and there we pitch our tent.

In the afternoon, wind had set in from the east, and the temperature rose to -39° ; it now seems as though it were about to blow more strongly, and to shift to the south-east. To the south the sky is cloudy. Are these the portents of a change of weather

and temperature? We are at the end of March, and the cold still is just as intense. By such a temperature a man does not perform a quarter of his usual amount of work. It becomes difficult to handle metal utensils; if they are taken up without precaution, one feels a pain like that of a burn, and a white streak marks the point which has been in contact with the metal; the smallest work becomes extremely difficult. If the wind were to blow strongly from the south, it would be truly welcome.

Collarino has not reappeared; I hope that he may come back, otherwise the dogs will lose sixteen rations of meat. We had intended to kill him this evening; Pollux was substituted in his stead.

We do honour to our dinner; it does not vary much, but always comforts. Having eaten our fill, we now think only of repose.

Sunday, April 1st.—Yesterday evening we pitched our tent on a wide level piece of ice near a large hummock, far from channels and pressure-ridges, hoping that we should be quiet and pass the night well. But all our precautions were of no avail; the ice offers surprises when one least expects them. About midnight, when the sleeping-bag and our clothes were already thawed and when that feeling of moist warmth was inviting sleep, we began to hear the well-known noise which is the forerunner of a pressure. As we lay with our bodies and our heads resting directly on the ice, we heard the sounds very distinctly, more intensely, and in all their variations. We listened to this rather unpleasant music without leaving the bag, waiting for it to cease. The hummock was proof for us that the bank of ice was thicker at that point than all around, and would probably offer more resistance. We trusted, therefore, that it would protect us against

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the attacks of the neighbouring ice-fields, and so remained comparatively tranquil. But the noise went on increasing; it seemed to be coming nearer; the ice creaked and groaned loudly, and the dogs outside showed uneasiness; some of them barked. One of the men went out to see what was taking place. The ice-field had been split at twenty or thirty feet from the tent, and was opening out and forming a channel; one of the sledges was in a dangerous position, on the very edge. We pull the sledge into a safe place, and, what is very disagreeable, we have also to remove our tent. A pressure-ridge is rising behind the hummock, a much too dangerous neighbour to allow us to repose quietly. The wind is blowing stiffly from the south-east, and pierces us to the bone. We carry the tent away, much against our will, and drag all our baggage to about 300 feet from the channel. After raising the tent, we return to the bag. It was an hour or more before we were warmed and fell asleep.

The south-east wind is blowing more strongly this morning. It is useless to think of setting out. We consult the barometer, which has fallen three-tenths of an inch and tends to fall still lower. This barometric movement comforts us; it foretells a change of weather, which, considering the season, can only bring us the much desired southern winds, the mildness of which will afford us some relief. To-day (Sunday) is a day of rest; it is now twenty-two days since we left Teplitz Bay, and it is the first time that we allow ourselves the luxury of passing a day in peace. Both ourselves and our dogs really require it, and we feel grateful to the bad weather for having granted us some repose. At mid-day, we light the cooking-stove and prepare an ample breakfast, to spare ourselves the trouble of cooking the dinner later and especially to economise our provisions. Our rations for the return journey are

The Return of the Second Detachment 629

calculated for eighteen days' march, but bad weather is an unknown quantity which must be taken into consideration, and might prolong our stay on the ice-pack. Outside, the wind has slackened, but it has begun to snow, and we cannot see a hundred yards away. Having appeased our appetites, we enter the sleeping-bag, and to-morrow, if the weather allows, we shall rise early, fresh and reinvigorated, and try to make up for lost time. How comfortable we are to-day under the tent with a temperature of -22° ! What a relief it is to be able to touch and handle the cooking utensils without gloves and without feeling our hands burned!

Then, in the sleeping-bag, we are warm and we rest well. Collarino has not come back; it seems strange that it should have been lost; perhaps it went back and joined Cagni's detachment. (It was, indeed, lost; I asked Cagni and his companions on their return, but no one ever saw it.)

Monday, April 2nd.—The wind continued to blow strongly all night; this morning it seems as though about to subside. We rise at ten, and while waiting to be able to leave, prepare breakfast. How warm it feels! The thermometer rose for a moment to -12° , a real summer temperature. A little heat renovates our bodies and souls. The mere thought that we should no longer undergo the martyrdom of a temperature below -40° makes us good-humoured. The southern winds we longed for so much have at last come to our assistance; they have vanquished the cold in an instant and brought us with their tepid breath the vigour of spring and a greeting from our distant countries. The weather is not yet settled, and the barometer has fallen again. Is there going to be another gale?

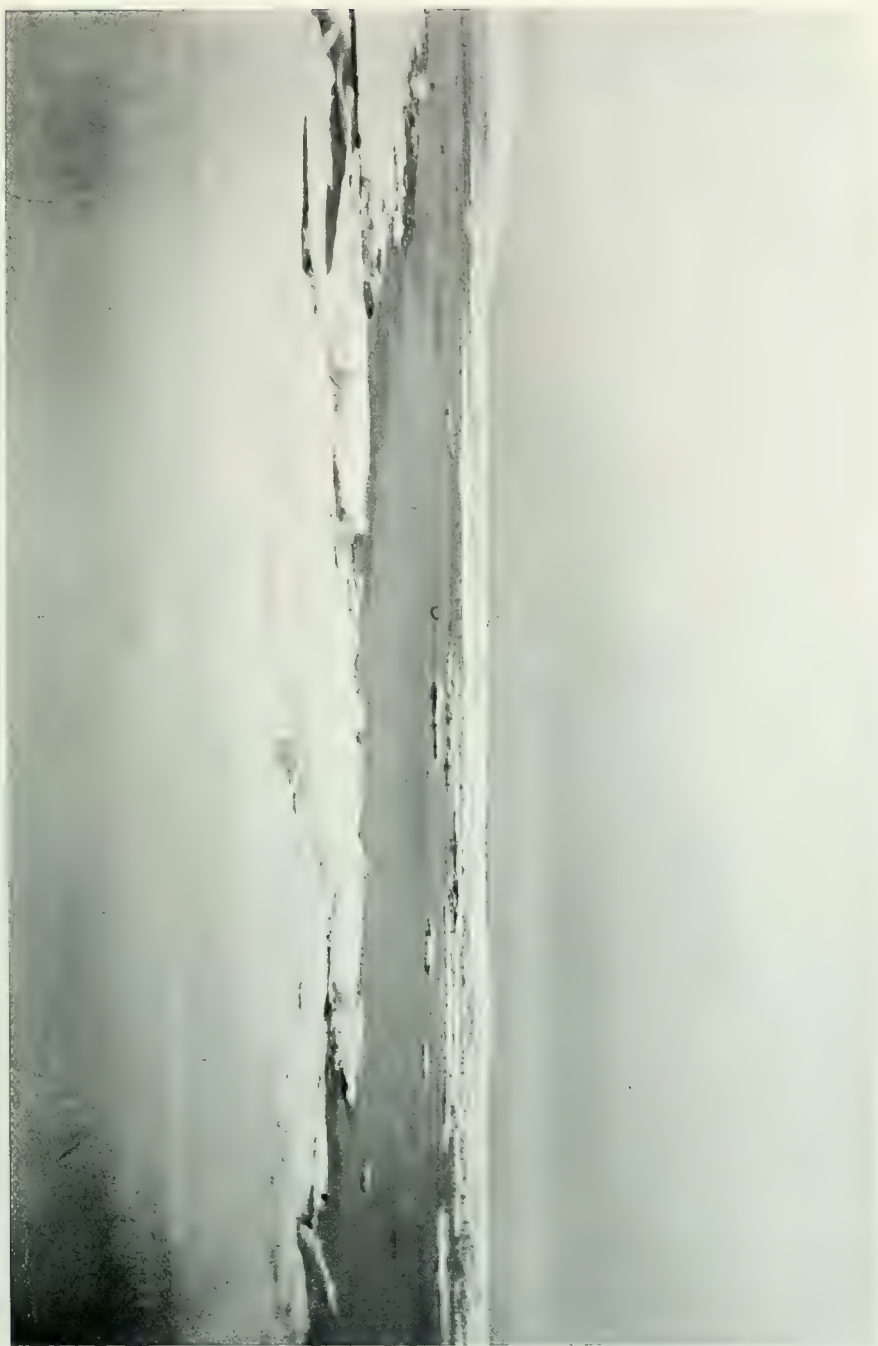
At noon we set out in perfectly calm weather. A fog completely envelops us and prevents us from seeing far. Yesterday's

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fall of snow has effaced our tracks and left a layer of soft snow, into which the sledges sink. We can hardly advance, but we still go on. We are in the midst of a network of channels which oblige us to make long windings in search of a crossing. We have hardly got over one when we are stopped by another a few hundred feet farther, and must again seek some spot where it is possible to cross. We make very little progress.

The fog lifts at three, and the sun appears for a moment, with a large and splendid iridescent halo which has a luminous body on the top. The wind has shifted to the west. It brings sleet and snowdrift, and is growing stronger; at five the drift is so thick that we cannot see each other a few steps away. I wish to pitch the tent at some point where there might be shelter, but the wind assails us with fury; a storm rushes down from the west with an ominous whistle and takes its revenge on the southern winds. We are blockaded by channels in every direction, and are obliged to hastily encamp where we are. A slight elevation gives us some little protection. We place the sledge which carries the *kayak*—being a little higher this will give more shelter—at the back of the tent to windward; the two other sledges are on each side, and shut in by them and solidly bound to them, we raise the tent in the centre. We leave the dogs loose, that by their natural instinct they may provide as best they may for their safety. Together with the sleeping-bag we carry into the tent the cooking-stove, the provisions, and everything necessary to resist the efforts of the storm and to repair whatever damage may be caused. Outside, the snow will cover up everything, and it will be difficult to find any given object when wanted. Meanwhile there rages a regular tempest of wind and snow. It is blowing strongly, and there is a succession of violent gusts. We shut ourselves in the tent, which

THE PACK, AS SEEN BY DR. CAVALLI ON HIS RETURN



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flaps loudly, and, though made of strong silk, we have some doubts as to its power of resistance. It is the first time it has been so severely tested. The wind has made the temperature fall to -32° .

We have lost an ice-axe to-day. When crossing a canal and trying to drag an ice-floe to a point where it was narrow, in order that it might serve us as a bridge, the ice-axe slipped out of Cardenti's hand into the sea and went to the bottom at once. We have only two remaining; we shall keep them carefully and use them with caution, for when in the neighbourhood of the island they will be absolutely necessary to help us carve our way.

Tuesday, April 3rd.—The violent gusts of wind lasted all night; this morning they quietened down a little, but the snow-drift continues the same. The snow is heaped up on the sides of the tent, completely covering the sledges, and forming all round a protecting wall. The tent has stood the test well, and this reassures us for the future. Last night's gusts of wind caused us some alarm, but now, surrounded by snow and half-buried in it as we are, we run no more danger. The poor dogs are lying close to each other under the shelter of the tent, and are quite covered in snow. A slight undulation in the snow, in a line with the tent, marks their place of refuge, and a layer of snow protects them from the inclemency of the weather. The storm keeps us shut up in the tent, and we repose in the sleeping-bag. At two o'clock we make a good breakfast, with butter, bread, pemmican, and coffee. As we are not travelling, we shall do without dinner; the dogs, too, have only half rations.

Every now and then we look at the barometer. It is rising slowly. This is a good sign; the weather may perhaps improve to-morrow, and we hope then to be able to go on our way again. As the snowfall of April 1st has blotted out the tracks of the

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sledges, we must henceforth make our own road, and so we shall not be able to go so quickly. It would have been so very convenient to have followed those tracks for three or four days, even if we had deviated a little from our route. We should have advanced far towards the south in a very short time.

The temperature varies still between -26° and -30° .

Wednesday, April 4th.—We have been now stretched in the sleeping-bag for thirty-six hours, and, indeed, have had enough of it. To-day is the fifth since we separated from Cagni's detachment, and we have accomplished only one day's journey, not reckoning the couple of miles which we went on the second. If this compulsory inaction was at first a relief to us, now that it is lasting so long it has become wearisome. The *modus in rebus* seems to be little known in these latitudes, and not at all observed; everything goes by bounds and successive periods. Are we now caught in the period of bad weather? I remember that last November a storm of wind and snow lasted nearly nine days. This would be no joke. The barometer makes no end of promises, for it is still rising, and we trust it. This tempest must be a great hindrance to Cagni; so many days lost for marching to the north. And he required to be assisted by fine weather and by the nature of the way so much!

This morning everything promises a day like yesterday. There is a stiff wind from the west, drift, and fog—that evil trio which inexorably keeps us prisoners. We rose at eight, tired of staying in the sleeping-bag, and satisfied the imperious demands of our stomachs with the usual breakfast. The wind seems as though about to subside. We wait; perhaps we may be able to leave the tent and set out. To pass the time, I take out of the pocket of my jacket the miniature edition of Dante graciously

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given me by Her Majesty Queen Margherita, and begin to read, and comment upon to my companions, a canto of the *Inferno*, an excellent distraction for tedious moments. But the cold warns us to leave off, and to prudently withdraw into our sleeping-bag and wait there. There are only -32° , but as we can take no exercise, we can only be comfortable in the bag.



GATTO ("THE CAT"), A DOG BELONGING TO THE
SECOND DETACHMENT (BROUGHT BACK TO ITALY)

About one o'clock we hear the dogs jumping about outside, running round the tent and making a great uproar. It is a certain sign that the wind has gone down. Thus they express their joy at coming to life again. They rub themselves in every way upon the ice, and run and jump to free themselves from the snow, which has penetrated into their thick hair, to warm themselves and revive their benumbed limbs. We go out to take part in

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the rejoicings. The wind has slackened, and no longer has the strength to raise and carry the snow, which is as dry and fine as the sand of the desert. The sun has rent the black veil of fog, and the atmosphere is clearing rapidly. We dig out the sledges, give the dogs a half ration of pemmican, and at half-past three we raise our camp, delighted at being able, at last, to set out again. We direct ourselves towards south-south-east. For the line to follow we trust to the sun and to the chronometer ; the sun is a safe guide ; for our purpose it represents a compass more than sufficiently exact, and having the advantage of not being subject to any variations.

Some of the canals which surrounded us are closed up, others are frozen so as to be able to bear both ourselves and the sledges. The snow is in good condition, the horizon clear, and we go on quickly. In half an hour we arrive at a long and high girdle of pressure-ridges, running from east to west. I climb up to the highest point, but cannot see the end of it, neither to the right nor to the left. Behind this wall, other walls of great blocks of ice, packed up on each other, rise majestically. We go in among them where there seems to be an easier passage, but the farther we advance the more difficult we find it to go on. It is wearisome to be forced to open a way through so many obstacles. Luckily, some recently frozen channels in the midst of these pinnacles of ice extricate us from our difficulties, and we find a long stretch of level ice before us. After we have gone a short distance, it is a pleasant surprise to meet again with the imprints left by our sledges when on the journey out—two parallel, salient strips of hard snow, which the late storm was not able to obliterate completely. It would be impossible to say with what rejoicing we greeted this happy discovery, which would not only enable us to

make up for lost time, but probably to gain some days. As soon as the dogs were set on the old tracks, they followed them rapidly. We had to hasten our steps and sometimes to let ourselves be drawn on the sledges, in order not to remain behind. We thus go beyond the site of our camp of March 27th, and at ten o'clock pitch our tent, not very far from that of our camp of the 26th. We are stopped by a vast assemblage of recently formed pressure-ridges. They seem to be more extensive and more rugged than those passed to-day. We must look out for a pass, which it may, perhaps, take some time to find. We are tired, and it is better to encamp. In the morning, when the wind is calm, difficulties will appear less complicated, and as we have rested, they can be surmounted with less fatigue. We lie down towards midnight. To the north we see the sun just touching the horizon—a great globe of fire, enlarged by the effect of refraction, and surrounded by a reddish orange haze, the varied tints of which melt gradually into the blue sky of the zenith. The white and slender summits of the ridges, the innumerable spikes, and the variously shaped pinnacles of the bluish white blocks of ice, stand out sharply on that reddish ground like burning ruins flaming in the ruddy light of the sunset. It is a truly imposing spectacle. While contemplating these wonders of the Arctic seas, the imagination becomes vividly impressed by the majestic grandeur of the scene.

Thursday, April 5th.—Rejoicing yesterday, sadness to-day ; it has been the most perfidious day we have passed on the ice-pack. Yesterday evening, after dinner, Savoie went to seek a passage ; but though he went very far, he found nothing, and this morning he was not more lucky. The pressure-ridges cover an immense space. They form a confused accumulation of enormous blocks, twisted and piled up and overlapping each other in a thousand

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ways, with sharp and pointed pinnacles rising in all directions, and bordering deep holes, which form regular snares for our feet—overhanging masses which seem ready to fall at any moment, crevasses and channels crossing in every direction. One might say that they were the ruins of some gigantic city, with its monuments overthrown, its church towers destroyed, and its palaces demolished all at one blow, a true image of chaos under its most dreary aspect.

We went exploring to the east and to the west without any result. The way is moderately good only to the north. It is useless to waste any more time in unprofitable researches; we would employ it better in attempting to open our way by force. By working with the ice-axes, we succeed in passing through the first ridge and making the sledges pass with some difficulty; we cross another, and then a belt bristling with blocks and intersected by channels. But the ice becomes still more rugged and impassable, and it is impossible to go farther. We must return on our steps; and as the ice seems to be better a little more to the west, we make an attempt on that side. At first we meet with the same difficulties, till we come to a channel about thirty feet wide, recently frozen and running towards the east. The small pieces of ice, crushed by pressure and floating on the surface of the water, have become consolidated by the newly formed ice, and the result is a most rugged mass covered with spikes and pinnacles, like rocks, which injure our feet and the sledges. We go on upon the channel very well pleased at having been able to escape in any way from such a terrible labyrinth. We followed it for more than an hour towards the east; then it turned towards the south, but the ice bordering on it was very little better. It was old ice, all very uneven, on which it would have been fatiguing to travel. As

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we had come to the end, we had to leave the channel, and in trying to cross from one shore to the other, I get all my leg wet, as the ice in the middle was thinner. Cardenti was still more unlucky, and sank in with both legs up to the waist—a disagreeable surprise in the present temperature. By squeezing from top to bottom the part which has got wet, we pressed out the water before it was able to completely soak our clothes. Then, by rubbing with dry snow, which rapidly absorbs water, we found means to become as dry as possible. We employed this method every time similar misfortunes happened to us, which was only too frequently.

The sky is quite overcast and cloudy; the sun has been seen through the clouds only for a few moments, and a light south-east wind has been blowing since eleven.

As if there had not been enough of varied adventures to-day, we found ourselves at two o'clock, without knowing how, in the midst of a thicket of ridges of old formation, among which the wind of the last few days has accumulated a great quantity of soft snow, in which we sink always above the knees, and sometimes up to the waist. The sledges and the dogs undergo the same disagreeable fate as ourselves. A light veil of fog renders our situation more critical. When it clears up for a moment, we see from an elevated summit a rather large level tract, about two or three hundred yards from us, which we resolve to reach to pitch our camp there. What toil and fatigue did not that short trip cost us! We had to lift up and drive forward both sledges and dogs, on an uneven surface, on which it was difficult to stand upright, and while half buried in the snow. The poor brutes were worn out, and it was the only day on which we used the whip. As a supreme misfortune, while thus continually slipping about we mistook our direction, and spent nearly three hours in immense efforts to

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extricate ourselves. We pitched our tent at seven o'clock, on a wide, level space, broken down with fatigue, but pleased at having surmounted our difficulties, and convinced that very few obstacles could stop us. In a march of nine hours we had covered, at most, four or five miles, but after a bad road we shall find a good one, and it will be our business to make up for lost time.

The south-east wind has become fresher, and brings some snowdrift with it. Does it intend to shut us up again in our tent? As soon as we were under it, Cardenti had to change his trousers, which had become hardened with frost, and he put on those of sailcloth—a truly summer costume.

Friday, April 6th.—The sledges were much damaged yesterday. The shocks, the falls, and the sharp jutting points on the channel injured them very much. Two have lost the metal covering of their runners, whilst the other is in a deplorable condition. As we had to mend them and make some changes in the loads, we were not ready till one o'clock, when we went on until seven. I purposely wished to stop rather early; otherwise, if we go to bed late at night, we rise late on the following morning. Rest is absolutely indispensable. When we get into the sleeping-bag, it takes more than an hour to thaw our clothes and the bag, and to fall asleep. We sleep in the damp, and awake next morning with our outer garments soaking wet, especially about the legs. We are, as it were, condemned to be rolled up in wet clothes every night. Our health, however, does not suffer from it; with the exception of a slight numbness of the limbs, the muscles of which become stiff and move slowly, we do not endure any inconvenience. Two or three quick movements give us back all our elasticity. Our active life in this pure open air gives us an enviable appetite, and we look forward to the hours of our meals with a certain feeling of pleasure.

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To-day the temperature is high (-23° in the morning, and -27° in the evening); we felt warm while marching. Our way was tolerably good; perhaps it was partly owing to the lively impression left in our minds by the very bad travelling of yesterday, in comparison with which any other would seem good. Enlightened by painful experience, we took good care not to penetrate among pressure-ridges joining each other over a great expanse, and of which we cannot see the end. But if that is possible in clear weather, when the sight can range far, so as to take in the vast panorama, and indicate the places where it is easier to pass, in foggy weather we must let ourselves be guided only by the compass and by good luck; and this latter element is too perfidious and always dangerous. This morning we found a fine channel closed up, about sixty feet broad, near our camp. The currents brought the edges together, and enabled us to cross. In order to avoid and to turn an extensive series of pressure-ridges, we marched for two hours straight to the west, so that our progress to-day was but slight. We crossed several channels, with partial and unavoidable wettings of our legs. Savoie was the principal victim. The snow is hard, it bears almost everywhere, and it does not tire us to walk on it. We hope that to-morrow we shall find the way good, and make good progress. I think that between yesterday and to-day I have got past that spot, all ridges and channels, which stopped us on Sunday, March 25th, and we crossed on the 26th, passing over recently frozen channels as straight and smooth as high roads.

A south-easterly breeze has accompanied us all day. As six we enjoy the spectacle of a large iridescent halo round the sun, a phenomenon which we observe with pleasure. It is the only agreeable distraction which the sky can afford, to give us some relief from the lamentable monotony of the terrestrial landscape. This circle of many colours

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recalls to our minds the rainbow of our beautiful country, that messenger of peace which announces to the anxious farmer the end of the tempest. At the place where we encamp, we find the recently made tracks of a bear, directed towards the north. If he were still roaming about anywhere in the neighbourhood, and thought fit to honour us with a visit, he would be welcome.

Saturday, April 7th.—To-day was excellent from every point of view; the air was pure, there was no wind, the ice was smooth, and we travelled a long distance. A fine morning gave promise of a splendid day, and it was such indeed. The north-easterly breeze during the night had cleared the air, and as the sun rose higher it gradually drove away a light mist which still lingered on the distant horizon. The sun possesses the magic power of transforming everything with the splendour of its rays, and it can beautify even this white and boundless icy desert. In the calm, pure, and very clear air, myriads of very minute transparent crystals of ice can be seen suspended and in continual movement, and, as they present their microscopic facets to the solar rays, so their reflections place before our eyes the marvellous image of a shower of very fine silver rain. This white and sparkling dust is in perfect harmony with the pure environment of the eternal snows.

When there is a temperature of -33° and no wind, it is easy to bear the cold. In eight hours of good marching we have covered about eighteen miles. The channels, which mostly ran from east to west, were frozen and easy to cross, and we walked for nearly two hours on an extensive plain of ice without any obstacle. Two or three stages like that of to-day would bring us within sight of Prince Rudolph Island.

Sunday, April 8th.—The fine weather is in our favour, so we

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take advantage of it to make up for lost time and advance on our way. We have had another day like yesterday—a clear sky, sunshine, and a good surface on which to travel. The sun gladdens our march and raises our spirits; it seems to enliven us and increase our reserve of strength; we feel stronger and in the evening less weary. We set out at ten; I had intended to stop at mid-day for a moment, to take a meridian altitude, but on account of a slight mistake, the sun had already passed the meridian when I took the observation. Savoie, who preceded me with the sledge containing the instruments, misunderstood my orders; he was at too great a distance at the proper moment, and thus unwittingly delayed the observation. I did not care much about this mishap, as we calculated that we should still require two or three days more before sighting land. What was our astonishment when about one o'clock we saw low down on the horizon, almost due south, a dark form that at one time seemed to be land, at another a cloud. Cardenti and I had watched it without mentioning it to each other for some time, doubting lest we should see it change its shape and disappear. Meanwhile, I thought over in my mind the distance I had travelled since I had left Cagni, and, comparing it with that which we had covered since the day when we had lost sight of the island, had come to the conclusion that we certainly could not see land as yet. But despite the closest reasoning, that form remained fixed at the same point, and the shape of its regular and well-marked curve did not vary. It was impossible to be deceived; it could only be land. I clambered up the highest hillock, and observed it with the binoculars. Yes, it was indeed land. “Land! land!” I cried out to my companions, and with the activity of deer they both soon join me on the summit, impatient to be convinced with their own eyes that

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it is really land before us. They also direct the binoculars on it, and we all feel certain. With inexpressible joy we greet it with loud hurrahs. I find by the compass that its bearing is 147° (magnetic). All is well; we are on the right track, and we continue our march with fresh enthusiasm and increased vigour. The shape of the island becomes more and more distinct and sharply marked; as we advance, it rises gradually above the horizon, and its features become visible. That is, indeed, our Prince Rudolph Island; we recognise it by its outline, by its undulating back with the hump, which rises higher in the centre, and by the whole profile. There can be no doubt about it, and our thoughts run swiftly and persistently towards the hut, and our comrades who await us there, and we have a foretaste of the joy to be caused by our arrival.

When we left Teplitz Bay, we lost sight of the island in nine or ten days; we had a long train of sledges, fully laden, and neither ourselves nor the dogs were then accustomed to the hardships of camp life. Now that our sledges are almost empty, and ourselves hardened veterans, taught by experience to take advantage of the smallest detail, with the seductive mirage of putting an end to this hard life by reaching our winter encampment before us, we may cover the same road in four days if the weather allows. In our present situation, our material needs prevail over all others and serve as a powerful lever to urge us forward; the mere thought of going back to sleep in a dry place in our little camp beds, of being able to change our clothes and wash ourselves, and of sitting on a chair round a table at meal-times in a warm room, excites our wills so strongly that our strength is doubled. Forgetting our fatigues and discomforts, we direct all our efforts to no other object than reaching our goal, and that as speedily as possible.

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Under this impulse we have made good progress to-day; I calculate that we have not done less than twenty-two miles. It has, indeed, been our most profitable day's work. We traversed extensive plains of smooth new ice, formed during this winter, on which we advanced wonderfully well. Then came ridges and channels for a short distance. We stop at seven o'clock, and have still part of the plain before us. Some open channels may be seen, but we hope that during the night they may close up or freeze. The temperature has risen to -24° . In the afternoon the wind was from the south-west; towards evening the sky became overcast, and it is snowing. Our adviser, the barometer, is stationary, and there is, therefore, no evil indication. Phœbus will probably rise in splendour to-morrow, to light us on our way. Six hours of marching have brought us much nearer to the island, and three or four days of fine weather should suffice to reach it. To-day we saw a seal in a channel, and some little auks came to bear us a greeting from the land.

It is a feast-day; we celebrated it by serving out an increased ration of bread, butter, and tea; the dogs got a whole ration of pemmican, in order to lighten the loads on the sledges and keep as many dogs as possible alive. We are wealthy; we have nine days' full rations for ourselves, with some reserve, nineteen dogs, and four or five days' pemmican for them; as the land is near, we can allow ourselves some luxuries.

Monday, April 9th.—The sky is dark and it is snowing; the southerly winds come saturated with aqueous vapour, enveloping and hiding everything with a veil of fog. The layer of snow which fell recently makes everything white, with a dazzling whiteness against which the smoked spectacles afford no protection. The air and the snow produce upon the eye the same

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impression of white diffused light, and on account of the absence of shadows which give relief to objects, it is impossible to estimate the inequalities of the surface. The one who goes first to show the way suffers the most; he strikes against the projecting points of ice and is caught by them, sinks into heaps of snow and crevasses, and where there is a steep incline he loses his balance and falls full length on the snow. We take it in turn to perform this unpleasant task. It is inexpressibly annoying to have to advance under such conditions. We have the greatest difficulty in keeping our course, and must rectify it at every moment with the compass, which is not an insignificant loss of time. We have to stop, place the compass about thirty feet away from the sledges, wait till the needle is steady, and then follow its direction, at the continual risk of unintentionally penetrating among pressure-ridges or entering upon uneven ice, from which we can only extricate ourselves by great labour and by untiring patience. This is precisely what happened to us this morning. After having crossed the flat expanse which we had seen yesterday evening, we struggled for three hours amidst rows of blocks of ice which seemed as though they had been purposely placed there to impede our march. Towards three o'clock the weather became brighter, and we can see land exactly due south; we also see that the ice is very bad in every direction. We advance slowly, wandering, as the bears do, from one block to the other, and gradually make our way with the help of the ice-axes. At six o'clock we raise our tent under shelter of a high ridge. We have made little progress in nine hours; perhaps six or seven miles. With a little fine weather and a moderately good way, we shall encamp to-morrow under the island.

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Bianchino, one of our best dogs, is worn out with fatigue. I am, therefore, reluctantly obliged to have it killed. I pity the poor brute! It has always done its duty with self-abnegation, and has perhaps been reduced to this state because it never spared itself for a moment. Cruel and ungrateful reward for its fatigue and devotion!

Tuesday, April 10th.—Snow and fog are chiefly what persecute and torture us, with the ferocious persistence of two implacable enemies. It snowed all night, and this morning we set out in the midst of snowdrift and fog. About noon, the wind shifts to the west, scatters the fog, and lets the sun peep through the clouds. The ice is still the same—execrable on account of the soft snow which covers it, and impracticable on account of obstacles of every sort. To resist the current which is carrying me to the west, I held my course to-day towards the south-east. I would wish to touch the island on the eastern side, to avoid the channel which almost always bounds it on the west. But the difficulties which I met did not allow me to continue long in that direction. Still, I think that I have gained a little to the east. Prince Rudolph Island lies to the south; it seems narrow, shows but little, and presents its smaller diameter. We see where the glacier falls precipitously into the sea, but the ice which separates us from it is in such disorder that I fear we shall employ more than one day in crossing it.

At one o'clock, the star of day appeared, surrounded by a magnificent halo, the most beautiful I have ever seen. It is a circle of light, shining with all the colours of the prism, divided by a horizontal diameter, with two parhelions at its extremities, making three suns on the same line. There is a large luminous body in contact with the upper limb.

At half-past seven a channel stops our way; as we are tired

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and have not the energy to look for a crossing, we pitch our tent. With the west wind the temperature has fallen to -36° ; if it were to last two or three days, it would just suit us. The fog would disappear and the channels would freeze.

Wednesday, April 11th.—The more we approach the island, the greater are the obstacles, and the less progress do we make. For five hours this morning we dragged ourselves through a rugged belt of blocks, resembling a moraine in the Alps, and crossed innumerable ridges. At last, from an elevated spot, we see a fine plain, from which we are separated by three high pressure-ridges of the worst description, with narrow hollows filled with broken ice between. There is only one way of getting down to the plain, and that is by scaling these cyclopean walls. We set to work with a will, attracted by the hope of being able at last to find ice over which it might be possible to travel. While we were toiling over these blocks of ice, a channel opened out beyond the pressure-ridges, parallel to them and stretching away out of sight. It is irritating, and enough to make one lose patience. We decide on making a bridge at the narrowest spot. The floating ice lends itself very well to our plan; the materials are abundant and under our hands. We throw enough slabs and lumps of ice into the channel to make a floor thick enough to support our weight. It takes less time and material to do so than we had thought. We pass with the sledges over the floating bridge thus improvised, and then advance well for about three hours. We are always deviating to the west; the island bears due south-south-east from us. Cape Germania, the farthest point to the west, covers the other capes situated more to the south. In the background are the Karl Alexander Islands and others which are nearer.

Friday, April 13th.—The 12th, which had begun in sunshine,

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changed in the course of the afternoon to snowdrift and thick fog. The ice was tolerably good, and we were able to make a considerable advance. To-day, with damp weather and a gloomy sky, we have very bad ice. We were able to see land this morning to east-south-east for a moment. The drift had carried us to the west, though yesterday we had directed our course towards the east. As we advance very little, the current has the advantage over us. The island is not far off; we might reach it in a day, but with such weather cannot even think of it. At ten it again begins to snow, and after noon a stiff south-easterly breeze stings our faces with hardened snow in the shape of minute grains. We sink into the snow, and the wind and diffused light complete our troubles. It is martyrdom. I think that I have tasted all the pleasures of travelling in sledges over the ice-pack; it would now be about time to reach the end. The southern wind brings an intense heat. Yesterday evening the thermometer stood at -5° . It is thawing, as in midsummer, and we are steeped in water. The dogs' pemmican has been all served out; from to-day I shall feed them with the flesh of their fellows.

Saturday, April 14th.—The bad weather continues with lamentable perseverance; the wind, which has shifted to the south-west, brings fog and snow with it in the afternoon. We are near the island, but have been unable to see it until towards the evening. Cape Germania bears south-east (magnetic) from us. We are the sport of the wind and of the drift, which toss us about at their pleasure. The wind has changed the current; we are now being driven to the north and to the east. The snow is so soft that it is impossible to make much progress. The wind has swept it away from the level places, and heaped it up behind all the inequalities of the surface. It is amusing to watch our passage over any

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elevation, no matter how slight. When we have got to the summit, we must either sink up to the waist in the snow and get out on our hands and knees, or roll down the inclined plane like a ball. The dogs and the sledges which follow the track of the guide extricate themselves better than we do.

We have been marching for about ten hours, but with all the turns and windings which the channels have obliged us to take, we have advanced but a few miles.

An accident in the kitchen to-day deprived our stomachs of the refreshing tea which we usually make about three o'clock. By mistake the cook (Cardenti was officiating on the occasion) put salt into the pot instead of sugar, and, naturally, to the same amount; the result was a nauseously bitter drink. The worst of it was, that we only perceived it at the last moment, when the bread which we had previously broken into the mess-tin was already soaked. As our provisions are beginning to run short, we had to give up our bread too.

The ice-pack is separated from the island by a broad channel; if I should reach the edge of it to-morrow, and not be able to cross, I shall launch the *kayak* and send Cardenti to fetch a boat from the hut.

Sunday, April 15th.—To-day is Easter, a day of gladness and rejoicing, and the sky has put on a festive aspect; there have been sunshine and calm weather all day. We were convinced that we should encamp on the island, it seemed so near, but in the evening, after twelve hours' wandering, we perceive that unless some change of temperature takes place we shall not be on land to-morrow even. We have about five miles to cross, but the ice-pack is so broken up, and there are such a number of channels, that it seems as though we were in the month of July. Such a high temperature

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in the month of April must be an exceptional phenomenon. As yesterday, the thermometer indicates -11° . The ice is splitting, opening out, and breaking up into small floes as it does in summer, and it requires a continuous and wearisome struggle to gain a few thousand yards. To be obliged to pass from one ice-field to another, and to have to wait, sometimes for hours, imprisoned on a large floe until some channel closes up, is a mode of progression which here, only a few steps from the island, almost makes one ill. A single day of intense cold would suffice to extricate us from our difficulties. This morning I got rid of all superfluous weights. I abandoned a sledge and the heavy camel-hair jackets which we kept in the sleeping-bag by way of mattress. They were saturated with water, and their weight was enormous. Our provisions have very nearly come to an end, and are no longer an encumbrance; by diminishing the rations I shall still have enough for four or five days. We squandered our savings as soon as we sighted land, certain that we should reach it very soon, but luckily, even if we make the very smallest progress, we shall be sure to reach land in that time. I still have two sledges lightly laden and eighteen dogs, which afford excellent facilities for covering great distances; but, on the other hand, by the decree of destiny we are almost fixed here at the mercy and caprice of the wind and the currents.

When it was time for tea, at one o'clock, we had not as yet lost all hope of pitching our tent on the glacier; we got plenty of water ready and washed ourselves for the first time since we had left Teplitz Bay. The medicine-chest furnished the soap, whilst the large outer cover of the cooking-stove served as basin; we were anxious to appear clean before our comrades, at least from the exterior.

We have pitched our tent between Cape Germania and Cape Säulen.

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Monday, April 16th.—The ice along the coast is terribly rugged; it is one uninterrupted pressure-ridge, jagged and impenetrable. We have to open a way for ourselves with the pick-axe, as in the virgin forests of equatorial countries. When we leave this chaos of ice-blocks, we find on the level ice innumerable channels which are equally detestable enemies. In order to avoid the ridges we had to go towards the south, thus departing from our route. It is snowing, the south-west wind is fresher, and the barometer is falling. Is a tempest approaching? At six, a wide channel stops the way, but as the ice-floes are moving, this may close up at any moment. We raise the tent to shelter ourselves from the inclemency of the weather, and prepare our dinner, but we are ready to start as soon as it will be possible. The fog is now added to the wind and snow, so it is best to encamp. This morning we put on the *kömagers*, as the *finskos* absorb too much water, and keep the feet wet.

Tuesday, April 17th.—We are in a world of surprises; as if our past and present difficulties, and tribulations of all sorts, were not enough, a curious phenomenon of optical illusion came to render the perplexity of our situation even more confused. When we came out of the tent this morning we could see neither Cape Germania nor Cape Säulen, which ought to be in front of us. The hazy atmosphere prevents our seeing far or finding our proper position, but through the thin veil of mist we can see land both to the north and south. There are two dark, massive forms, lofty and enlarged by the effect of refraction, which are certainly two capes. Between them, against a background of sky and cloud, is a dark undulating table-land, which has the appearance of an island. Where has the current carried us to during the night? The south-west wind has been blowing for three days, and the ice ought to have been driven to the north-east. But how explain the



THE BAY OF TEPLITZ, FROM THE EAST

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presence of this island? Perhaps we have gone more to the south, to the height of the strait between Prince Rudolph Island and Karl Alexander Land, and the little island may be Hohenlohe Island. In the midst of islands, the direction of the winds is subjected to local changes, and the currents which drive the ice-floes and are sometimes opposed to the wind are still more variable. However it may be, we shall go on towards the nearest point, which is precisely the little island, and when the fog lifts we shall know where we are. At any rate, we must put ourselves beyond danger from the currents by reaching land, and then we can wait in peace for a favourable moment to advance.

After we had marched for a couple of hours, the weather became clear ; we recognise Cape Germania to the south, and Cape Fligely to the north, and find that the little island in the middle is only the dark wall formed by the glacier falling abruptly down to the sea. The background, which seemed to be the sky, is the glacier itself, of azure blue, and the snow which the wind has heaped up on it in isolated patches of various contorted shapes with whitish tints stands out from it like clouds.

The current has brought us nearer to land, but carried us very much to the north. We are perhaps about six miles nearer than yesterday evening, and the ice pursues its bewildering course.

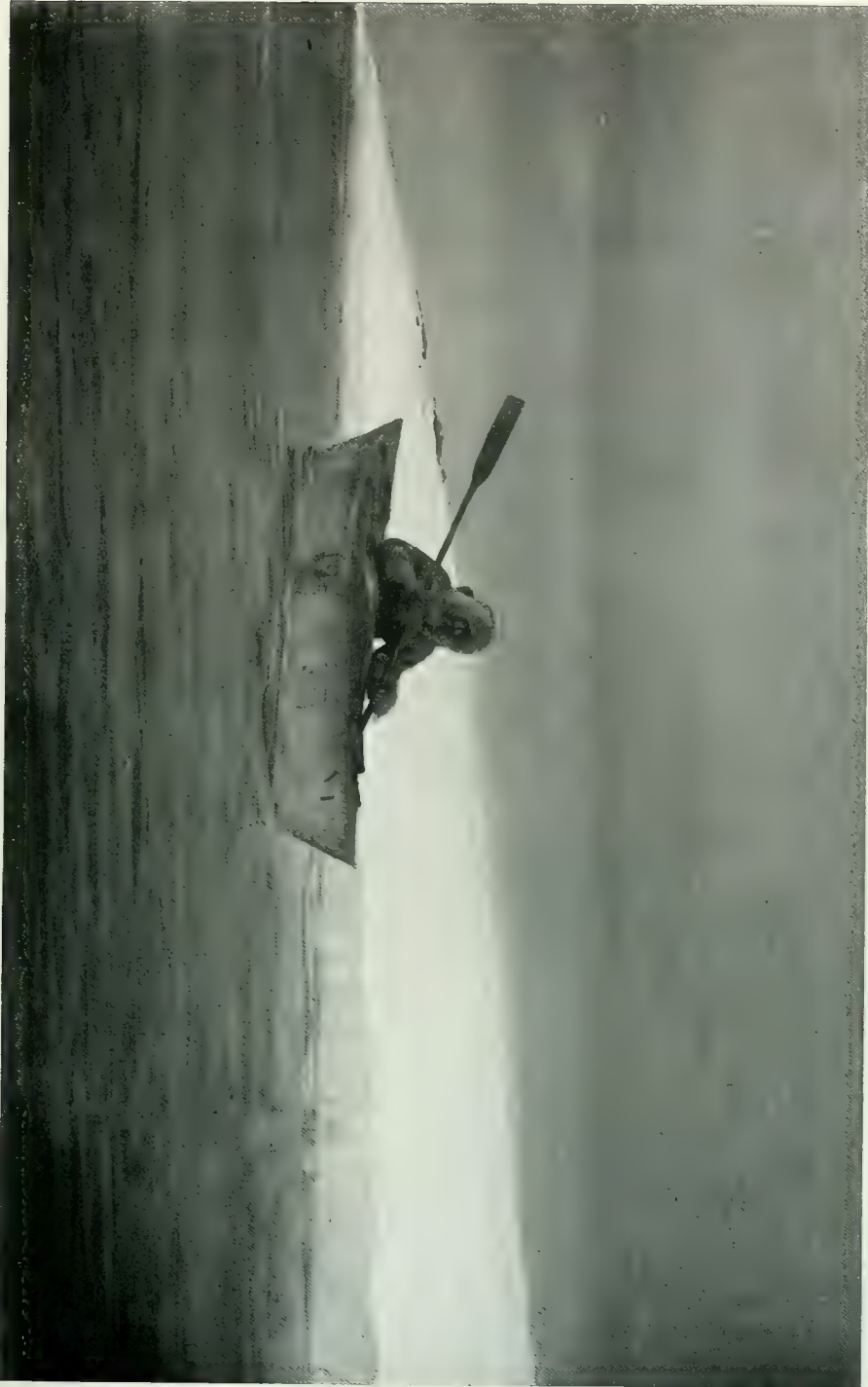
To the north and north-east of Prince Rudolph Island, a broad dark blue reflection on the sky warns us that in that direction a large expanse of sea is free from ice. If we do not reach the glacier before the current has made us pass Cape Fligely, who knows how far we may be tossed upon that open sea?

We hasten to set out at once. About a mile from the island a wide channel divides the ice-pack into two independent sections, each moving at a different rate. The portion nearest the land,

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being sheltered by the point of Cape Germania, moves more slowly, and we have to cross over to it in some way or another. The ice-floes swimming in the middle of the channel are too small to attempt to embark on them. We look for a crossing to the south, thus going against the current. A great mass of large blocks, which form a floating island, being driven more quickly by the wind, is approaching a narrow part of the channel; it is bristling with points, like a rock in the middle of the ocean. We wait for it at the gap. While it is forcing its way through, we risk ourselves upon it, running the danger of being kept prisoners if we do not hasten. But the dread of being carried away to the open sea gives us greater daring and strength. We quickly scale these sharp points, one of us dragging along the dogs, another pushing the sledges; we pass from one pinnacle to another, and, by very great efforts reach the opposite shore before the little island has moved away. As we are out of breath we give ourselves ten minutes, and then away again. At two o'clock we are at last at the glacier. The island is surrounded by a channel about one hundred yards broad; it is impossible to follow its edges, as the ice is too rugged. We have come four days sooner than had been agreed upon lately with Querini, on account of the changes made by Cagni in the definitive formation of the detachments, and therefore no one expects us. We decide on putting the *kayak* in order, and sending Cardenti to the camp for a boat. There are four or five patches to put on the sides, the lower and upper parts are intact. The little pump used to free the *kayak* from water works well; we put the rowlock and the oars in their places, and in less than an hour the *kayak* is in the water ready to start. Meanwhile, the dinner is got ready under the tent; we eat gaily, as the end of our wanderings is close at hand. I give Cardenti the most

CARDENTII APPROACHING THE GLACIER



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minute instructions as to ascending the glacier and reaching the camp, and I particularly warn him to secure the *kayak*, that the current may not carry it away, as we have no other means of giving him help. I gave him a rifle, a package of cartridges, an ice-axe, a long Alpine-climber's rope of manilla hemp, a compass, his wind overalls, and three of the ten biscuits remaining, with a note to His Royal Highness announcing my arrival, and asking him to send me a boat. After testing the *kayak*, Cardenti leaves at four o'clock.

Opposite to us the glacier ends at the sea by a steep and lofty ice-cliff; a little to the north is a spot where it is easier to climb up, but it cannot be approached, as a thin crust of ice covers the sea and stops the *kayak*. Cardenti steers for Cape Germania. We follow him with our eyes from a high point, anxious to see him safe upon the island. He disappears behind the block of ice, and at length we see him attach his boat to the glacier, descend the slope, and begin to scale it. The place he has chosen does not seem to be well adapted; the ice-cliff is high, and a cornice of snow which projects overhead will render the ascent difficult. I and Savoie, after unharnessing the dogs, proceed in that direction, with the gun and the little bread remaining, with the intention of at least helping Cardenti with our advice, and, if possible, to also pass on to the glacier. Three of us together would find it easier to succeed, and we could come next day to take the tent, sledges, and dogs. Our flag was hoisted on the highest point, to indicate the site of the camp. We take more than an hour to cross those 500 yards, as the ice is so rugged, and when we come opposite the place where Cardenti should have been, we neither see him nor the *kayak* on the sea. He must have descended to make the attempt at some other spot, or to return to the tent. We went back to the tent by the same way; Cardenti is not there. The sky is overcast, so

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it is useless to watch any longer. We should have been more at our ease if we had seen Cardenti on the glacier. We had agreed to wait until to-morrow evening, and stay on the bank of the channel.

Before entering the sleeping-bag, we take an inventory of all that remains to us, as we must know the state of our provisions exactly. We have three tins of preserved meat of 1 lb. 8 oz. 11 dr. each, a tin of butter of 10 oz. 9 dr., a tin of condensed milk, seven biscuits, enough Italian paste to make soup twice, 2 lb. of pemmican, enough petroleum to fill the lamp four times and a half (which may last two men for a fortnight), salt, coffee, and tea for ten days, and fifteen dogs. We are wealthy. To-morrow we shall reduce our baggage to what is strictly necessary, and collect all the load on a single sledge.

The ice-pack continues to move towards the north, and we slowly approach Cape Fligely. The wind has shifted to the north-east. It is blowing strongly, and may perhaps stop the drift of the ice towards the north.

Wednesday, April 18th.—Our expectation will make the day seem very tedious; it is therefore better to rest a little longer in the sleeping-bag. As we were getting up about half-past nine, it seemed to us that we heard human voices in the distance. Savoie puts his head out of the door of the tent, and sees the dogs looking intently towards the land, and we jump out hastily. On the slope of the mountain a group of men and dogs stands out sharply against the white snow, and on the sea is a boat coming towards us. An intense emotion seizes us—our privations and hardships are ended. Our comrades are there on the shore waiting for us; we look at them through the binoculars, and as they seem to be many, they must have all come to meet us. I feel so excited with joy that I cannot count them. Near our flag we hoist as a signal the

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large cover of the cooking-stove, which, on account of its circular shape, can be seen from far away. Two men are rowing in the boat ; one is our boatswain Christian—I recognise him easily ; the other, small but sturdy, seems to me to be Querini. During the night the ice-pack driven by the north-east wind has receded from the land, leaving a large expanse of open water, and it will be some time before the boat reaches us. We get our breakfast ready and



DEFILIPPI, A DOG OF THE SECOND DETACHMENT (BROUGHT BACK TO ITALY)

collect all our baggage. Captain Evensen has come with the boatswain. After greeting each other, Evensen says to me : “ *Mr. Querini has not come back.*” I am astounded, and doubting whether I had understood him rightly, I ask : “What did you say ?” He repeats : “ *Messrs. Querini, Stökken, and Ollier have not come back.*”¹ Oh, what a misfortune ! On hearing this news, as sad and terrible as it was unexpected, I remained as though in a dream. It seemed to me

¹ These sentences are in English in the original.—*Trans.*

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impossible, and I repeated to myself : "The first detachment has not come back !" I could not understand it. It was impossible to reason in presence of such a misfortune.

It was useless to question the others ; they knew still less than we did. Our comrades had left the expedition on the morning of March 23rd, and ought to have been at our winter camp by the end of March. They were in excellent health, with a single sledge and ten dogs, and the weather was favourable ; why, then, were they not able to arrive ? What fatal mishap hindered them from reaching the island ? They were furnished with provisions up to April 2nd, and after that day they could have prolonged their existence by eating dogs' flesh, or game if they could find any. What can have been their fate ? These questions and a thousand others which presented themselves to my mind remained unanswered. The enigma could not be solved. Since April 8th we have been in sight of land, and for ten days have wandered about in the neighbourhood without perceiving any trace of them. And how would it be possible to find them on an immense floating desert of ice, which undergoes continual transformations, splits up into a thousand channels, and closes again immediately, piling up unceasingly blocks upon blocks in high ridges, destined in their turn to sink into the sea, to change their forms and be again reconstructed without ever resting, and where, at last, a bed of snow effaces, covers, and levels everything ? It is sad to think that three of our dear comrades are, perhaps, in a critical or desperate situation, and that we do not know where to go and help them. The absence of the first detachment does away with all the joy we feel at our arrival.

We invite the two new-comers to breakfast ; then, placing one sledge, the sleeping-bag, the case of instruments, and eight dogs in

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the boat, I left for the land. Savoie came in a second journey with the rest of the baggage. We were received by His Royal Highness and by all our comrades with enthusiastic hurrahs, and that evening we were all united in the warm hut, satisfied with the successful termination of our expedition.

REPORT
OF
DR. ACHILLE CAVALLI MOLINELLI
ON THE STATE OF HEALTH OF THE EXPEDITION

REPORT ON THE STATE OF HEALTH OF THE EXPEDITION

THE state of health of the members of the expedition during the Arctic campaign of the *Polar Star* (June, 1899—September, 1900) was not only satisfactory from every point of view, but surpassed even the most sanguine expectations. The fact that the majority of the Italian contingent were absolutely unused to the mode of life and surroundings which they were about to face for the first time, during a very long period, gave rise to many remarks not altogether favourable to their powers of endurance and capacity of adaptation. The difference between the usages of the two climates was too great, the change from one to the other too rapid; there were too many causes which would enfeeble and waste the system, and the consequence would be to facilitate inevitably the development of maladies, especially the most terrible among them, scurvy, which in those regions had already cut short the lives of many daring and chivalrous men. And resting upon these natural conjectures, we have heard competent persons, both in Italy and abroad, manifest their fears, and express doubtful opinions with regard to our physical capacity to successfully support the fatigue and severe trials to which we were about to expose ourselves with light-hearted enthusiasm.

Although our task was not easy, and the problem to be solved rather difficult, many facts combined to strengthen our confidence

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in our ultimate success, and these we put forward in reply to the foregoing objections.

First of all, the sturdiness and activity of other worthy compatriots of ours, who took part in recent Arctic expeditions, gave evident proof that these fears were groundless. In both ancient and modern civil and military expeditions, the vital force of our race had given evidence of its endurance by the facility with which it adapted itself to climatic influences in the extremes of heat and cold ; there was, therefore, no serious reason why it should behave otherwise in this expedition, provided that those elementary and general rules which should guide a careful, well-directed, and provident organisation were scrupulously observed.

Secondly, our arrival in the Emperor Franz Josef Archipelago was to take place during the summer, when the temperature is nearly equal to that of winter in the north of Italy ; we would thus have time, before the rigour of winter supervened, to gradually and progressively accustom our bodies to low temperatures by continual exercise in the open air, and so render them strong and fit to undergo the trial.

Then the experience of others taught us how little all those causes of rheumatic disorders which produce so many maladies in our regions were to be feared. In the health report of the voyage of H.R.H. the Duke of the Abruzzi to Mount St. Elias, in Alaska, Dr. De Filippi expresses himself thus : “A fact worthy of being noted is the relative freedom from all the causes of the so-called rheumatic disorders which one enjoys while living on the glaciers, where one is continually exposed, more than in any other mode of life, to precisely all those conditions which might seem to be most favourable for the production of rheumatic maladies. Not a single one of the twenty-one men was ever afflicted with muscular

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rheumatism or pains in the articulations, or catarrh of the bronchial tubes, even in its mildest form of a simple cold."

Our mode of life was identical with that led on the glaciers, except with regard to the height above the sea level.

We all, individually, became convinced of the same facts during our sojourn in the Arctic regions, which is further proof,



ONE WHO WENT FARTHEST NORTH

were any still wanting, in confirmation of the microbic origin of many maladies, a fruitful discovery which has marked a new epoch of decisive advance in medical science. In those regions infectious maladies are few in number, for the simple reason that the determinant element, the microbe, is wanting. We must certainly have brought with us, in ourselves and in our belongings, an

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unknown number of them, both innocuous and pathogenic, but the environment was not favourable to their development. The intense cold in winter, the cold and the continuous and intense light in the other seasons, deadened their energies.

All uneasiness, therefore, with regard to the more numerous and fatal of the infectious diseases having been removed, there still remained all those causes of weakness due to the deleterious influence exercised on our organism by the climate, especially by the long Polar night, and by what we might term chemical action—that is to say, the introduction and absorption of poisons under any form, to which are attributed those profound perturbations of general nutrition, and the serious anæmia and cachetia, the forerunners and the coadjutors of the appearance of scurvy. The researches and studies made by Nansen and Blessing, during the long campaign of the *Fram*, gave as their result the absolute exclusion of any influence of the Polar night on the mass of the globules of blood. They found that the quantity of hæmoglobin and the number of the globules underwent no abnormal variations as the seasons changed, and that the blood always remained in its normal condition, thus proving the non-existence of a Polar anæmia. With regard to ourselves, we all experienced during the winter season a feeling of greater comfort and an increase of weight, evident signs of an excellent state of health.

As to scurvy, the latest researches on the subject tend to classify it among infectious maladies. The origin of the disease, the circumstances which attend its manifestations, its course and the epidemic character by which it is sometimes marked, and finally the decisive experiments made by inoculating animals with the blood of scorbutic patients, all speak in favour of bacterial infection. Students of bacteriology have described various micro-

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organisms, which are looked upon as the direct cause of the malady. But by taking into full consideration the predisposing causes produced by the peculiar conditions under which we were lodged and fed ; by seeking in every way to guard our system from everything which might be a source of weakness, and, on the contrary, by strengthening it with suitable food and appropriate hygienic measures, scurvy was no longer a grave danger for us. It returned into the category of ordinary diseases, and its infectious nature would perhaps render its development more difficult. Wherefore, after considering the question from every point of view, the confidence we reposed in the force of resistance of our system was not lessened, but strengthened, since every fear vanished in the presence of serious examination.

To carry out our intention of keeping ourselves as much as possible healthy and strong in body and mind, we had, as teacher and guide, the experience of all those who had gone before us on this difficult road, and especially the wonderful progress which science and industry had placed at our service.

In the patient and minute work of making preparations for the expedition, H.R.H. the Duke of the Abruzzi and Captain Cagni united to the prudent advice of others their personal experiences, acquired in the Alaska expedition. These suggested simple and useful details of the necessities of life under a tent on a glacier, a contribution of great value in the organisation of the enterprise.

The greatest care was given to the provisions furnished to the expedition, in order that nothing should be wanting or afterwards appear to be defective ; and special attention was given to the choice of food—a most important element of moral and physical well-being. The provisions were procured partly in Italy

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and partly abroad (in Denmark and Norway) in great abundance, both as regards quantity and variety.

All sorts of salted and smoked meat were put aside, as they do not present sufficient guarantee for keeping well, and the different varieties which were purchased were made up in tins upon the Appert system—that is to say, sterilised by boiling. The other provisions were hermetically closed in tin boxes, after having been previously perfectly desiccated. We had reason to congratulate ourselves on this step, as the preservation of all the stores, in spite of the rough treatment which the boxes underwent in their many journeys, was perfect. After a year and a half, the Italian paste for putting in soup, which is liable to be easily spoiled, had suffered no change, but kept its qualities undiminished.

All that was purchased in Italy—biscuits, Italian paste, rice, butter, oil, wine, vinegar, and a few preserves—was subjected to careful chemical examination by Signor Michaelangiolo Chiotti, Commissary of the First Class in the Royal Navy, then a student at the Royal Technical Institute of Sommellier, in Turin, and to his enlightened judgment is due the truly superior quality which the Italian provisions manifested, both when compared with others and when tried. I am very glad to be here able to express my gratitude to him, both as a friend and as a doctor, for it is certain that wholesome food is the surest prophylactic against any sort of ailment.

Another important and fundamental element of the general well-being was the wise regulations of His Royal Highness that the food should be the same for all, so that there should be no difference between the chiefs and the subordinates. The daily rations were cooked together, and then divided between the table of the officers



*Torgensen, Andersen, Hobben,
 Dr. Carvelli, Capt. Evensen, Capt. Eagen, Lieut. Queren,
 Officers of "The Polar Star"*

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and that of the crew, in proportion to the number of the persons at each — an equitable arrangement, and the thought which suggested it was very noble from a civil, moral, and material point of view, for it not only strengthened still more the good understanding between superiors and inferiors, but was also very useful as a hygienic measure.

The food was prepared according to the methods employed in Italian cookery, and our Norwegian comrades conformed to them very easily and with pleasure. (The expedition was composed of eleven Italians and nine Norwegians.) There were three meals a day : breakfast at eight, dinner at twelve, and supper at six.

A considerable amount of fat had been left in the rations, for it is the food-stuff which is the most efficient and the most suited for the production of heat ; and to satisfy the desire felt equally by all, of consuming a large quantity of fatty matter, due to that necessity which impels the system to seek some compensation for an increased loss of heat, butter was allowed to be eaten *ad libitum* at table. It is wonderful how the body of itself provides instinctively for its real wants, by carefully modifying its demands, and making us desire and prefer that nutriment most fitted to establish the balance between what is eaten and what is consumed, according to our surroundings. The quantity of fat which could be introduced into the stomach, and digested and assimilated without any bad results, was a surprise to us Italians.

Among the foods which influence the nervous system, the preference was given to tea and coffee, which were much drunk, while the use of fermented alcoholic liquors was restricted. A small quantity of wine was allowed in the evening at supper (about 4 oz. 3 dr. of red wine, Barolo ; or 2 oz. 1 dr. of white

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wine, with a large amount of alcohol, port wine, or madeira). We all preferred the red wine—I do not know if on account of our habits and our tastes, or because it was pure, or whether it was on account of its astringent property, owing to the tannin which it contains. But it is certain that after that glass of Barolo one felt a peculiar feeling of comfort, and the digestion seemed easier and under a kindly influence, which did not occur when we drank white wine. The Norwegians attributed the increase in the weight of our bodies which took place during the winter to the Barolo wine, and used to say that red wine fattens. I believe that good red wine might be admitted with excellent results among the many remedies suggested as anti-scorbutics.

For many reasons, both our stock of wine and its consumption were limited. Besides the difficulty of preserving it at those low temperatures, and the necessity of taking special precautions for that purpose, we should have to do without it during the sledge excursion to the north, which was to take place during the coldest months of the year, and would require us to exert our strength to the utmost. A cup of strong hot tea or coffee, by its action on the nervous system, on the circulation, or on nutrition in general, represents a tonic which is much more efficacious, powerful, and natural than wine or alcohol for the purpose of helping the system to resist severe toil, and of reinvigorating it after the great organic waste caused by the climate and fatigue. The change had, therefore, to be made slowly, in order that the body should be prepared for the exclusive use of tea and coffee, and become accustomed to it.

Although other distilled alcoholic liquors, such as cognac, rum, brandy, whisky, were among our stores, they were only employed

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as seasoning or medicine, and their use otherwise prohibited; we brought them home almost untouched.

We were obliged to demand and obtain a larger production of heat from some more lasting and safer source than the absorption of a small quantity of alcohol. When the stomach is in good condition and able to digest easily and quickly, it is a workshop for the production of combustible elements on which we can reckon at any moment; the greatest care should therefore be taken to avoid the least disturbance in the functions of the various organs intended for the digestion and assimilation of food.

Though I should not wish to deny to alcohol the character of a heat-producing food, which is unanimously attributed to it by physiologists, hygienists, and the public, it was not advisable to forget its injurious action on some important organs of the body, especially on the mucous membrane of the stomach and on the liver. Under the peculiar conditions of our life it would have been easy to pass from use to abuse, with disastrous results easy to foresee.

It is at the present moment a disputed question as to whether a greater production of heat is the consequence of the absorption of alcohol. Without wishing to take part in the discussion, I transcribe the words of Dr. Aubner, from the *Manual of Alimentary Medicine*, by E. von Leyden: "It is an error to consider the warmth which is felt after absorption of alcohol as a production of heat; the sensation of warmth does not suffice to demonstrate an increase of the production of heat, but merely indicates a flow of blood to the skin. By measuring with a calorimeter the heat given out by a man's arm after the absorption of alcohol, although there was an increased sensation of heat, I was not able to detect any increase in the emission of heat."

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As a means of checking waste it may be said that alcohol has had its day ; according to that erroneous idea, it was advised to give it to all obliged to undergo fatiguing muscular labour, both workmen and soldiers, without distinction. Fresh researches providentially modified this view and brought back the action of alcohol within its true bounds—to the position of a stimulant of the nervous system. Moreover, the artificial and transient action of alcohol is followed by depression, prostration of strength, and a torpor of the intellectual faculties, which would be supremely dangerous for us, as we required continual attention, vigilance, and promptitude in order to face all the dangers always lying in wait for us.

For this reason, as a compensation for the great loss of heat, it was considered preferable to provide a larger amount of nutritive and heat-producing aliments, and to make use of tea and coffee as nervous stimulants.

As a drink during the day, we used coffee and water, or water alone. We procured this by melting the snow, and it was served out when wanted, both for drinking and for personal cleanliness. In summer time we made use of that which was plentifully furnished, limpid, fresh, and pure, by the neighbouring glaciers.

Biscuits were given out twice a week alternately with fresh bread made by the cook and baked in the little oven of the kitchen. This change was intended to prevent the constant use of biscuits becoming tiresome ; the absorption of hydrates of carbon was thereby much diminished, but that was partly compensated by a greater consumption of fat. It also aimed at lessening the fatigue of the digestive tube, caused by the large amount of gastric and intestinal juices required to digest and assimilate this kind of food.

Fresh meat was provided by the bears and the birds abounding in those regions ; we also collected a certain number of fresh eggs

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in the months of June and July. As in the case of the bread, fresh meat was cooked once or twice a week, and more frequently when there were birds. Although its quality was not all that could be wished, it agreed well with the stomach, and ended ultimately by pleasing the palate, which, perhaps, became accustomed to it. As the birds were all aquatic, their flesh had a slight smell of fish, but this was attenuated by the careful culinary treatment it underwent. The bears' flesh was of a dark red colour ; it had the characteristic flavour of game, and was rich in fat, but tough and stringy. The loin and the tongue were the most delicate and succulent parts of the bear, and when well cooked they made an excellent *ragoût*.

Milk was another precious article of food much used ; we had three qualities—namely, natural sterilised, condensed, and condensed and sweetened milk. The last is the best adapted for lengthy keeping, and should be preferred, as, according to the latest opinions with regard to the importance of sugar as a food, its greater richness in this respect renders it more useful to those who have to undergo fatigue. The unsweetened milk kept under the tent did not deteriorate, but that left outside and exposed to the outer temperature became unserviceable.

We had an abundant supply of dried vegetables as well as in powder and tins ; every sort of greenstuff and fruit, dried and tinned ; potatoes cut in slices and dried, others cooked and then dried ; sweet preserves, marmalade, honey, chocolate, and cheese of all sorts. All these formed part of our daily rations in proper proportions.

The great variety of our provisions allowed a continual change of food, of different qualities, capable of preparation in different ways, and of thus breaking the uniformity caused by the necessity we were under of exclusively making use of tinned foods, which

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no season had power to replace. The weariness manifested by the stomach in similar cases was not felt by us, as our appetites never failed.

If the efficacy of the precautions taken with regard to our food may be judged by the results obtained, I can affirm that they could not have been better, for our digestive organs always acted with the utmost regularity, to the great advantage of the entire system; our good nourishment proved more than sufficient to counterbalance the waste of strength and loss of heat, and none of us ever felt the want of alcohol to cheer the spirits or excite good humour and gaiety, which, as the natural products of an excellent state of health, were always our faithful companions.

For our clothing we always kept to woollen stuffs, which we had of various qualities. The degree of resistance offered by a garment to the loss of heat depends upon the quality of the tissue and upon its thickness, since the greater amount of air contained in the web diminishes its power of conducting heat. Another important quality which clothes should possess is porosity, in order to allow the escape of aqueous vapour produced by cutaneous transpiration, especially while undergoing fatiguing toil or on a march, and so prevent the damp from collecting in excessive quantity under the form of aqueous vapour in the inner layers; they should also keep the wearer warm, and be light and flexible. Woollen clothing answers these *desiderata* better than furs, which are not very porous, and for this reason, though we had a number of fur garments, we were always dressed in wool.

Before coming to a decision as to the choice of dress for the sledge expedition, we made experiments with various garments with the object of ascertaining which were practically the most convenient. We were unanimously of opinion that we should not use fur coats.

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We found that a fur coat isolates the body more completely from the outer air; it indeed accumulates and preserves beneath itself a larger amount of heat, the loss of which is diminished by its slight porosity and permeability, but when the body is subjected to severe labour and therefore tends to perspire, the above-mentioned properties become disadvantageous, precisely because they facilitate cutaneous transpiration and at the same time impede its evaporation, thereby condensing within them a superabundant quantity of moisture. The clothes worn under the fur coat, which we employed as outer garment in our experiments, became excessively saturated with perspiration and dried very slowly, so that after a fatiguing march we were obliged to change almost everything. The fact that we were not accustomed to wear fur coats must of course have contributed somewhat to produce this result, since there are entire nations of hard workers who derive much advantage from this method of protection, to us unbearable.

We could not hope to be able to change our clothes after every march, when on our way towards the north on sledges, and consequently, during the halts, the body would be deprived by its clothing of an important amount of heat, just when it would require the greatest on account of diminished production. When wearing jackets of sealskin, the lightest and softest of furs, which have the fur outside, the case was different; the aqueous vapour escaping from the body became deposited on the inner surface of the jacket and froze there, and so in a few days it would have become unserviceable. The jacket fell freely, and was not bound to the body, so as to allow the circulation of air; if it had been girded to the waist this inconvenience might have been avoided, but only by incurring the other above indicated. With woollen clothes, which facilitate evaporation, and diminish the accumulation

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of perspiration, there was also this advantage—that the congelation of the aqueous vapour of the body took place on the outer surface, and so could be partly scraped away by mechanical means; on account of this, clothes of some smooth stuff were preferred to hairy.

The following example shows how important it is when selecting and making up clothing for those regions to take its porosity into due account. Among the items of the outfit which we wore during the time we passed on the sledges were waistcoats, which buttoned on the right side, made of a thick but very soft woollen stuff, known in commerce as camel's-hair tissue, strengthened on the shoulders, under the armpits, and on the sides with pieces of fustian, a strong, close, and not very porous cotton tissue. These waistcoats, after a few days' march, became hard with the frost, and when at night we took them off before getting into the sleeping-bag, they stood up straight like a cuirass. When the period of intense cold passed, they became, little by little, as supple as before; but where they had been strengthened a deposit of snow, in the shape of raised cushions, had been formed, and of this we were not completely rid until before the stove at our winter camp. Very thick stuffs cannot be recommended, as when once they are wet it is difficult to dry them.

We followed the same rules in choosing our head-dress, which was made of woollen stuffs; and woollen gloves were also selected for the protection of our hands. The fur gloves, though very useful for short excursions or for a walk, proved unfit when one had no means to dry them properly after prolonged work. They showed the same defects as the fur coats; they accumulated damp internally and froze hard when taken off, and it was impossible to put them on again. The best for winter are those made with a separate thumb, and very wide; in very cold weather gloves with

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separate fingers are dangerous, as they may give rise to very serious mishaps, such as, unfortunately, we had to regret.

As foot-gear we wore thick woollen stockings and *finstos*—shoes of half-tanned reindeer-skin with the hair outside. They are very thin, without soles, heels, or opening on the instep, drawn on like stockings, and tied at the lower third of the leg with a band round them; they are very light, flexible, easy to put on, and keep one warm. As they have not stiff, solid soles, we felt the unevenness of the ground at first, but our feet remedied that as the skin of the soles increased in thickness. These shoes were filled with sedge grass so as to completely wrap up the feet. This grass has the property of absorbing moisture, and keeps the feet dry. The *finstos* may be said to be indispensable for winter, and it would be impossible to imagine any better foot-gear. In summer we used thick shoes of leather or wooden clogs.

The medical equipment consisted of a complete pharmacy for the ship, two small portable medicine-chests, and a diminutive leather medicine-case which could be fixed to a belt.

The ship's pharmacy was well provided with drugs and remedies, and every utensil and appliance necessary for relieving and curing the sick. It had a case of surgical instruments, containing everything essential for performing operations, a pocket-case of surgical instruments, microscope, a Bizzozero chromocytometer, a Thomas-Zeiss hæmatometer, and reagents for clinical examinations. Almost all the medicines were in compressed tablets.¹

The two medicine-chests, which measured 10 in. $\times$ 7 $\frac{1}{4}$ in. $\times$ 5 $\frac{1}{2}$ in., contained a quantity of the principal drugs, divided into doses, in

¹ The ship's pharmacy and the medicines were furnished by the firm of Rognoni, of Turin; the medicine-chests by Burroughs, Wellcome & Co., of London; the surgical instruments by Bergamini, of Bologna; the chromocytometer, the hæmatometer, and the microscope by Koriska, of Milan.

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the shape of tabloids and soloids (so as to be useful for quickly preparing solutions of a given strength), a box of ophthalmic remedies, another for hypodermic injections, a clinical thermometer, a pair of scissors, a bistoury, some gauze bandages, and everything necessary for a first dressing. These two chests were to serve if the ship had to be abandoned, and the small surgical case if we were compelled to make a retreat in which absolutely everything superfluous would have to be left behind.

There were made in Turin for the sledge expedition four rectangular boxes of aluminium, strong and light, measuring $11\frac{1}{4}$ in. $\times$ $6\frac{3}{8}$ in. $\times$ $5\frac{1}{2}$ in. Each cover, which held more than a pint and a half of liquid, was detached, so that it could be used as a basin for antiseptic solutions, and each box was closed by an aluminium band two fingers in width, which went round it—a simple, solid, and practical system of closure. It would have been better if the covers had been made of white metal, as aluminium can be attacked by solutions of sublimate, which change its composition; but, nevertheless, they well answered their purpose.

The members of the expedition were selected with the greatest care and attention, in order that they should possess all the sturdiness and good health necessary for the crew of such an expedition. All who presented themselves underwent a careful, minute, and severe examination, and those who showed the slightest defect, or seemed less fit, were set aside. It had been decided that the limit of age should be from twenty-five to thirty-five (at which period of life a man has reached his full development and greatest strength), but for obvious reasons this restriction had to be relaxed, and made to extend from a minimum of twenty-one up to the age of forty-seven—that carried so youthfully by Captain Evensen. All gave proofs of great endurance, both of climate and hardships; but

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those who best stood their trials and seemed the most hardy were those nearest to thirty—the middle term, in which are united the enthusiasm of youth, ripeness of intellect, and energy of full manhood. All were re-vaccinated before embarking, with a favourable result in about a third of the number.

The *Polar Star* was the ship chosen to transport us to the Emperor Franz Josef Archipelago, and also to serve as our dwelling during the time we were to remain in the Polar seas; but on September 8th, 1899, we were obliged to abandon her, on account of the serious damage she received from the pressure of the ice, and to pitch a tent on shore. For this reason we passed the greater part of the time under canvas (from September 9th, 1899, to August 15th, 1900).

From a hygienic point of view, we gained by the change of dwelling, for our new surroundings were much more healthy than those on board, although the condition of the *Polar Star* in this respect was relatively good, having regard to the cold climate for which she was intended. She was an old but strongly built wooden whaler, qualified for her new mission by some modifications which were made. The hold and the lower deck were cleared of every encumbrance and changed into holds for coal and provisions, whilst abaft of the middle a deck-house was built to provide quarters.

Nine cabins were fitted up there (eight for the officers and one for the cook), the officers' saloon, a room for the crew, another small room for study, a closet for the scientific instruments, kitchen, pantry, infirmary and pharmacy. The sleeping-room for the crew was on the lower deck. Two side-doors open from the deck into our lodgings. Entering by the door on the left, after making a circuit we shall come out by that on the right. With the exception

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of the kitchen and of the little study, which are in the centre, all the other rooms are built against the sides of the ship. When we pass the door, we find the infirmary with two berths, then the pantry, the officers' saloon, the mate's cabin, the captain's cabin, another door opening into the little room for study, round which are four cabins for the Italian officers, and at the bottom, next the stern, the closet for the instruments, and a door which gives access to the poop and to the officers' lavatory. Going back by the second door of the little study, we find the cabins of the first and second engineers and the cook, the saloon for the crew, and the pharmacy. The cook's galley is between the two saloons, with the engine-room hatch abaft and the hand pumps forward. The lavatory for the crew is under the deck forward. The cabins are narrow, without port-holes, and they obtain air and light from the saloons; each has a skylight which opens on the quarter-deck. A staircase leads from the crew's saloon to their sleeping-room—a large room with eleven wide and comfortable berths placed round it, separated by about four inches from the sides of the ship, so as to allow the aqueous vapour condensed on the planking to flow freely away. Want of space had prevented the same course being followed with regard to the berths in the cabins, but a waterproof cloth had been fixed to the side of the ship above the berths instead, which could be spread like a tent over the bed. If we had passed the winter on board, this cloth would not have given the same result, on account of the way in which the sailors' bunks had been arranged. The sailors' quarters receive light and air from the companion hatch, through a pane of glass inserted in the ceiling, and from a door communicating with the lower deck; they are almost quite dark.

The three rooms and the sailors' quarters are each warmed

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by a cast-iron stove, lined with fire-clay, and furnished with a complicated system of tubes and valves to increase its power of heating and diminish the consumption of fuel ; it burned steam coal.

The ventilation of all these rooms would have proved rather defective, especially during the winter, and it was intended to rectify this when carrying out the works required to enable the ship to pass the winter. Large conduits would have brought pure air from the outside to the heating pipes of each stove, and thus provided an abundant, continuous, and rapid flow, whilst the door and the draught of the stoves would have sufficed to clear away that which was foul. But the abandonment of the ship cut short all these projects.

When we were obliged to leave our dwelling on board, we had to think of establishing another on land. Two large field-tents eighteen feet square and about thirteen feet high in the middle were pitched on shore near to each other, and having between them a space of sixteen feet for the kitchen. Both were covered with a second tent of sailcloth, got ready before our departure to cover the deck of the vessel during winter, and a third, very strongly made with the sails and the spars of the ship, served as an outer covering to the others and protected them from storms and from the pressure of the snow which might be heaped upon them. An empty space which was left between the first and the second tent, and between the second and the third, served as an isolating interval, and as a place for storing provisions. A small addition at the south-eastern extremity, provided with a door, served as porch, and here was placed the lavatory. A wooden door provided communication between the tents. A wooden flooring was made in both with timber brought from the ship, and each was furnished with a stove, camp-beds, tables, chairs,

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and everything requisite to satisfy the necessities of life. Coal was used for the purpose of heating, and petroleum lamps and candles for lighting.

The eight officers were lodged in one of the tents, and the twelve members of the crew in the other. The cubic capacity of the inner tents was relatively insufficient as regards aeration to the number of persons dwelling in them, but this was compensated for by the permeability of the materials employed in their construction. The renewal of the air was assisted by the draught of the stoves, and by numerous apertures, both in the sides and in the top of the field-tents; they were, indeed, so well aired that, even when the weather obliged us to remain within, there was no disagreeable smell or closeness. The hut, as we called it, proved excellent both for its strength and healthiness. It provided us with a safe and comfortable home, well-aired, dry, and warm.

The temperature inside, when the stove was lit, reached from $+15^{\circ}$ to $+18^{\circ}$ and, at night, when the stove was put out, rarely fell below 0° . The difference of temperature between the interior and the exterior was rather considerable, especially in winter; nevertheless, we went from a room heated up to $+15^{\circ}$ into the open air, which was at -35° or -40° , without finding it necessary to take those precautions the neglect of which in other countries would certainly induce illness. We mostly went out in the clothes we usually wore in the tent, well buttoning up our jackets and putting on caps and gloves; we went about freely, inside and out, without any anxiety, and nobody ever had to complain of bronchial catarrh, coughs, colds, or of chill; on the contrary, some of us who in Italy were frequently subject to chills were always free from them there. This happy immunity was derived from the purity of the air, which was free from those

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pathogenic micro-organisms which are veritable criminals plotting against our health and indispensable elements in the origin of many diseases.

On windy days we put on a second garment of thin but closely woven maroon-coloured cotton, known as "wind-repellers," made of two parts—a closed smock-frock, with a hood attached to it, and trousers; this dress was tied at the wrists, at the waist, and at the ankles to preserve us from the snow-dust, as fine as mist, which penetrated everywhere. This dust melted on touching the skin of the uncovered parts of the face, but stuck at once, and as it increased, formed a protective mask of ice. It was, however, a great annoyance to the eyes, as, to keep them free, we were obliged every now and then to detach the icicles from the eyelashes. Every hair on our faces, whether the beard or the eyelashes or the eyebrows, was covered with a coating of ice and gradually became joined into one mass with the neighbouring hairs. We shaved our beards and moustaches, but the eyes had to be constantly cared for.

How necessary these precautions are on windy days was discovered, to his cost, by one of the members of the expedition on December 23rd, 1899—that unlucky day on which eight of us were surprised by a violent tempest of wind and snow, and having lost our way, took several hours to reach the camp, and H.R.H. the Duke of the Abruzzi had two fingers frost-bitten. One of us had imprudently neglected to take the icicles from his eyelashes, and soon had both eyes closed and plugged up with two lumps of ice. And as it was impossible to take them off, the unfortunate man had to be led by the arm to the camp, where the heat of the stove freed him from this annoying and dangerous inconvenience.

The nose remained almost always uncovered, and never gave

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us any trouble; we had attached to our *passamontagne* (a species of knitted woollen head-dress, which covers the head and neck, leaving the eyes, nose, and mouth free, and is much worn in the Alps) a sort of woollen nose-protector, but it was more inconvenient than useful. In critical moments, when the nose turned white, a slight rubbing brought it back to its normal condition. We took care to warn each other.

The action of cold on the skin is identical with that of heat; there is the same succession of stages, from simple irritation to the mortification of the part affected, but naturally with a different physical action. We have all observed its development when producing anæsthesia by means of ether spray and ethyl chloride; the part becomes pale, whitish, anæmic, insensible and if the action lasts long, and is too strong, it freezes and mortifies. According to the injury received, there follows either a simple hyperæmic redness or the formation of phlyctæna, with fall of the epidermis, or the death of the tissues which are attacked by dry gangrene.

In cases of a certain gravity, there is seen on the second day, between the living and the dead flesh, an extravasation of blood which affords a rather safe criterion in estimating the extent and gravity of the injury. In the fingers especially, if the cutaneous tissues only have been attacked, the effusion of blood takes place in the sub-cutaneous cellular tissue, and invades all the part affected, which turns a dark colour; but if the mortification has penetrated deeply and to the centre, a circular dark ring is formed only at the point where both meet.

In the first place it is advisable to let out the extravasated blood by means of a puncture, as the pressure which it exercises not only causes intense pain, but is an obstacle to the circulation of the blood, already much impeded in the surrounding tissues.

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The process of reparation is always slow, as the cicatrisation must take place in tissues not in their normal condition, where both circulation and innervation have undergone serious disturbances. A proof of this is seen in the subsequent results ; for, after complete cicatrisation, there remain for several months in the injured locality an extraordinarily morbid and painful sensibility to cold, a lower local temperature, a diminution of the sense of feeling, and a dangerous liability to relapse. The part affected has less power of resistance, whilst the *restitutio ad integrum* takes place only after a long delay.

Cases of erythema on the skin of the face were slight and of rare occurrence, and no one was afflicted with chilblains on the hands or feet.

The only serious cases of frost-bite which demanded surgical treatment were those of H.R.H. the Duke of the Abruzzi and Commander Cagni, on the unlucky day mentioned.

The Duke had gone out, lightly dressed and wearing woollen gloves with separate fingers, to make a short excursion on *ski* ; he met the party training the dogs to draw the sledges, and joined them in order to ascertain what progress they had made. As the state of the ice was favourable, we went farther than usual from the camp ; and while coming back, a sudden and violent outburst of wind from the north enveloped us in a dense and opaque cloud of very fine snow, which made the night still more dark, and we strayed from the right way. Without being aware of the fact, we ascended a low glacier situated in the middle of Teplitz Bay, and came swiftly down the gentle incline on the opposite side. On coming to where the glacier ended, by a precipice at the edge of the sea, the Duke and Cagni fell down on the ice in the bay from a height of about twenty feet. From the top of the precipice

we called out anxiously to them, and were very glad when they answered that both were safe and sound, a bed of snow having broken their fall. The shock must, however, have been severe. We had to make a wide circuit to find a place down which we could go to assist them.

In the meantime the storm raged furiously, and increased the darkness. We had lost our way, and were without a compass, and for more than three hours we scrambled among those blocks of ice before reaching the hut. In the confusion Cagni lost a glove, which caused the first finger of his right hand to be frost-bitten, and His Royal Highness had the two last joints of the middle and the fourth fingers of his left hand frozen. We all received slight frost-bites on our wrists, faces, necks, and ears; but the Duke and Cagni, on account of their fall, were in a less favourable condition for resisting, and therefore suffered more. The Duke first became aware of his misfortune when, on returning to the tent, he took off his gloves, as the frost-bite had caused insensibility. The two fingers were of ashy whiteness, as hard as stone, and a clearly defined, livid, annular swelling situated at the articulation of the first and second phalanges marked the frozen part. The fingers were immediately rubbed with melting snow, then massage with cold water was employed, until the circulation was again renewed; but the last phalanx of both fingers gave small hopes of success. The Duke's gloves had been torn, probably by the fall, at the ends of those two fingers, which were left sticking out without protection, and so mortified.

On the second day an extravasation of blood was formed where the dead part ended, which on the middle finger was clearly defined, as it extended all round half the last phalanx, and on the fourth finger limited to the fleshy part of the end of

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the finger and half the nail. In order to spare the injured fingers as much as possible, about twenty days after the accident I amputated the two ends which had been attacked by dry gangrene, and left to Nature the task of defining exactly the mortified parts. The middle finger lost two-thirds of the last phalanx, and the fourth finger a third. It was a long time before the cure was complete.

Commander Cagni's injury was less serious ; he merely lost a nail and the skin of the first finger of his right hand, but this finger became a *locus minoris resistentiæ*, and during the sledge expedition to the north was again subject to frost-bite. Once, in the month of February, in those three days when we remained out with the sledges, he was also slightly bitten by the cold, which caused a formation of phlyctæna, but of this he was cured in about ten days ; and again, in March, after travelling for a few days. But the second time was more serious. Necrosis had set in at the extremity of the finger, which afterwards gave rise to suppuration ; the lymphatic vessels of the arm and the auxiliary glands became congested, so that, on May 2nd, Cagni was obliged to cut off the frozen part with a pair of scissors. On his return to the camp, at the end of June, the finger showed two small wounds, one at the extremity, the other at the matrix of the nail ; and at the bottom of both the uncovered bone was felt. The places where the flesh was dead were scraped with the spoon-saw, but as they did not heal, it was decided to remove the bone of the phalanx. It was then time for us to return home, and as the commander had to complete several observations, the operation, which, after all, was not urgent, was put off from day to day. In Turin, in the month of November following, Professor Carle took away the small portion left ; the bone of the

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ungual phalanx was then almost dead, but the articulation remained unhurt.

Intense cold acts upon the conjunctiva and the mucous membrane of the nose by exciting a greater amount of glandular secretion, which is most copious on first going into the open air; a fact also well known in our regions during winter, when the north wind blows. Breathing is freely performed, even on the most bitterly cold days, and as there is no dust in the atmosphere, there is hardly any bronchial secretion. It is, indeed, true that dust exists in those white and boundless solitudes, but it is of ice, and in harmony with its surroundings; it is formed of very minute crystals of ice, which float in the air, and give animation to that pure air with their silvery reflections on days when the sun shines brightly. This powder can leave no deposit in the bronchial tubes. On the return journey of the *Polar Star*, when we were in sight of the most northern point of Norway, we perceived the change in the purity of the air we were breathing from the sudden and continued necessity for expectoration; the bronchial tubes had become sensitive to the smallest quantity of dust in the air.

The expedition was provided with spectacles of smoked glass, and of divers shapes and sizes, to guard against snow-blindness, so common when ascending the glaciers of our Alps. These ocular and cutaneous changes are attributed to the radiation of the snow, and to the greater amount of ultra-violet rays in the light in the higher regions. Some other element may, perhaps, intervene to produce these ailments, as it was only in the summer months, from the end of May to the first days of August, that we experienced, and then not always, the want of smoked spectacles. In the other months of continuous daylight—that is to say, from March till October inclusively—the light of the sun and the

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radiation of the snow gave us no trouble, and none of us ever became seriously attacked with snow-blindness. I have witnessed a complete loss of sight through dazzling, in the case of our cook, but only for a short time. His occupation obliged him to stay long in the kitchen by the feeble light of a lamp, and on going out into the open air one day, when the sun was shining and the light was very brilliant, he was so dazzled that he became totally blind. But when he went back into the dark tent, he gradually regained his sight without requiring any treatment or feeling any bad results.

During the sledging excursion in the month of May, two of Commander Cagni's men were slightly affected by ophthalmia, with hyperæmia of the conjunctiva, for which he employed ocular discs of cocaine and of sulphate of zinc, with perfect success. During my return journey on sledges in April, one of my companions suffered from a slight irritation of the conjunctiva, produced by a material cause. Our faces had been beaten all day by very minute and hardened snow, driven by a swift wind, and the man who had acted as guide, who was more exposed than the others, as he had to ascertain where it would be most easy to pass, that evening had both conjunctivas red and irritated by the striking of the driven snow. A night's rest, however, was enough to cure him.

Spectacles can only be worn in summer, as in the other seasons the glasses are soon rendered opaque by deposits of ice.

The health records of our voyage present little that is interesting, on account of the excellent health enjoyed by the members of the expedition. In our passage from Christiania to Archangel (June 12th to July 1st, 1899), I had on board three cases of ephemeral rheumatic fever; I, for one, was affected by it,

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then Lieutenant Querini, and, thirdly, one of the firemen. The three cases presented the same symptoms; at first rheumatic pains in the articulations, calves of the legs and back, then headache and a sudden attack of fever, which rose rapidly to 40, its highest point, then fell by gradual termination on the second day, and disappeared on the third. The crisis was preceded by a copious perspiration. After leaving Archangel and coming into the midst of the ice, I had no more patients who required to be medically treated.

In October and February I examined the blood of four persons by means of Bizzozero's chromocitometer, and found that the hæmoglobin was, with a few variations, almost always in a normal condition. In the examination made in February, an increase was observed in one person, it was stationary in another, and in the other two there was a slight diminution. The weight of each of us was ascertained every month in 1899, and a gradual increase was observed in all from August till December, when the maximum was attained. Some of the crew had become so fat that they were not capable of any further increase.

In February, 1900, those who were to take part in the sledge expedition were weighed again, in order to observe any loss on their return; they had all lost since they had been weighed in December. I copy from my notes the data referring to my detachment, before and after the sledge expedition, as I have not been able to find those relating to Cagni's detachment:—

	lb.	oz.	dr.		lb.	oz.	dr.
Cavalli, February 15th, 1900.	145	1	0	April 18th, 1900	138	14	3
Cardenti	169	1	7		165	5	8
Savoie	162	11	5		157	13	9

The sledge expedition across the ice-pack had lasted, in the

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case of my expedition, from March 11th to April 18th inclusive—that is to say, thirty-nine days.

The loss in weight was relatively small, considering the hardships of the life we led, both on account of the low temperatures and the fatigue and privations of every sort. In the month of March the temperature varied between -36° and -48° C., and at night reached -50° . On April 1st southerly winds began to blow, and the temperature did not fall below -37° ; it rose on April 13th to -5° ; and on the 14th, 15th, 16th, and 17th it remained at -10° , much to our annoyance, for the snow began to melt and the ice to break up as in summer, an infinity of channels opened out which prevented us from making any advance, and meanwhile the currents capriciously tossed us here and there. Below -40° cold becomes unbearable, the more so as it is almost always accompanied by a light breeze. Any trivial work, any occupation which necessitates going without gloves, requires the greatest care. Everything of metal burns like red-hot iron, and must be handled with the utmost caution; it is dangerous to stand still, and one can only find relief from one's sufferings by moving about. The body becomes warm while walking, and it is then that one feels most at one's ease. Thanks to our active life, our appetites never failed, and the ration, of which I had fixed the quantity, answered its purpose very well.

By considering what had been done by former expeditions, and also taking for my special guidance the new principles laid down by modern science, I suggested the ration shown in the table on p. 696, which was adopted for the sledge expedition.

The quantity of nutriment possessed by this type of ration is very large, and its calorific capacity is 5,497 calories or units of heat—more than half of those furnished by the fatty substances.

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DETAILED ANALYSIS

OF THE COMPOSITION AND NUTRITIVE VALUE OF THE DAILY RATION.¹

FOOD-STUFFS.		Nutritive value expressed in grammes. ²		
Nature.	Quantity expressed in grammes.	Nitrogenised Substances.	Ternary and Thermo-genic Substances.	
		Albuminoids.	Fats.	Carbo-hydrates.
Biscuit	400	62'40	5'20	293'60
Italian paste for soup	50	6'50	0'14	38'30
Cooked beef in tins	250	68'62	33'32	—
Pemmican ³	300	100'50	172'50	—
Butter	100	0'70	82'60	—
Desiccated vegetables	30	7'11	0'42	16'35
Condensed and sweetened milk	40	4'88	4'32	19'72
Sugar	40	—	—	40'00
Liebig's Extract	10	5'00	—	—
Salt	14	—	—	—
Tea	7	—	—	—
Coffee, roasted and ground	18	—	—	—
Fried onions	5	—	—	—
Total	1,264	255'71	298'50	407'97
Equivalent in units of heat to		1,048'40	2,776'05	1,672'67
Total of units of heat			5,497	
Petroleum	180			

N.B.—1 gramme = 15'43 grains or 0'002 av. lb.

¹ On account of the cases and the wrappings and for greater convenience when serving out, the rations of butter, vegetables, and milk contained practically a few grammes less than the quantity marked in the table.

² The greater part of the data for the calculation for the nutritive value were drawn from Maestrelli's *Manual of Bromatology*.

³ Composed of powdered fat and flesh in equal quantities.

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At first sight it may seem to be superabundantly rich in, and too heavily laden with, fat; but it was necessary to take into account the probability that eventually it might be diminished, and also the serious loss of heat to which we should be exposed.

In the first days of our march, indeed, we found it ample, but afterwards only about enough. We made two meals; one in the morning, before setting out, of coffee and milk, bread, and pemmican; the other in the evening, when we pitched our tent, of soup, bread, preserved meat, butter, and tea. Sometimes we also had tea at mid-day. The rations had all been scrupulously weighed and divided so as to render distribution easy.

By the experience acquired in thirty-nine days, I ascertained that in practice the above ration gave good results; it is nutritious without being too heavy, the stomach bears it well, it is easy to digest and assimilate, and easily and quickly cooked. In a word, it was well adapted to our special circumstances. If regularly and entirely consumed, it fully compensates for all organic losses and satisfies the demands of hunger.

I would, however, recommend some extension with regard to the quantity of the foods which influence the nervous system—that is to say, to increase the tea to 10 gr. (5 dr.), the coffee to 25 (13 dr.), and the sugar proportionately to 50 (1 oz. 12 dr.); there was an excess of salt, as the greater part of the provisions had been sufficiently seasoned while being prepared.

Pemmican is composed of powdered beef and beef-fat mixed together in equal parts. It was prepared in the shape of parallelo-pipeds, of light chocolate colour, each weighing 8 oz. 12 dr. If carefully prepared, it forms an excellent food for cold climates, on account of the high nutritive value it relatively possesses to its light weight and small volume; its preservation and transport do

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not require any special covering, and it is easily digested. Its taste is not pleasant ; at first it is very disagreeable, but afterwards the palate becomes reconciled to it by appetite, the greater demands of the system, and the want of something to replace it. It is quickly cooked and prepared ; when boiled for a few minutes, in plenty of water, it dissolves into a sort of thick broth ; we added some salt and desiccated vegetables to it as seasoning, and ate bread with it.

Our tea and coffee were so diluted with water as to introduce into the system a sufficient quantity to supply the wants of the body during the day. We rarely experienced the unpleasant sensation of thirst, and when we did it was enough to wet the palate and throat with little bits of snow, first pressed in the palm of the hand to raise their temperature, to relieve it. The digestive organs worked regularly, and were not incommoded by this food, which well agreed with us all. Commander Cagni, during his return journey in the early days of May, suffered for a few days from intestinal derangements, but this was probably caused more by excessive fatigue than food.

The speedy restoration of our bodies to their normal condition, when we returned to the encampment where we had passed the winter, was proof of the excellent condition of our digestive systems ; in a few days each of us regained and surpassed his usual weight.

The sledge expedition was composed of ten persons, divided into three detachments. Each detachment was provided with a field-tent of silk, as a defence against the inclemency of the weather during halts and at night. This indispensable protection provided a shelter from storms of wind and drifting snow.

A bag of reindeer-skin, with the hair inside, large enough to

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hold three or four persons, according to the number of the party, served as a common bed. Each of us had also a special bag of thin woollen stuff, quilted with down, into which he first slipped before entering the reindeer-skin bag together with his companions. The sleeping-bag protected us fairly well, while resting, during all the time the expedition lasted, and, as long as it remained dry, provided us with a warm, comfortable, and pleasant retreat, even on the coldest nights. We felt some difficulty of breathing when shut up in the bag, on account of the want of air, which we remedied by raising the cover in folds, in the shape of long tunnels, to serve as air-holes.

After a few days, the interior of the bag became damp, either from our breath or from our garments thawing, and this moisture went on increasing until at last we slept in wet clothes. We might, perhaps, have been able to avoid this by keeping our faces uncovered, so as to send our breath directly to the outer air, and taking off our woollen dress before going to bed. But the dread of having our faces frozen during sleep guided us in the choice of the bag, and for many reasons we often went to bed wearing our waistcoats, trousers, and sometimes even, though rarely, our shoes. The sleeping-bags of down were more saturated with water, and became, in consequence, hardened by frost, so that at night two of us had to pull them out in every direction before being able to get in. When the reindeer-skin bag was opened, the small quantity of air which got into it condensed the internal moisture, covering the hairs of the fur with hoar-frost and snow, and a certain amount of this snow was collected on the lower surface of the bag, which touched the ground. We resolved one evening to sweep out the interior of the bag, and we took out about a quart of fine snow. The reindeer-skin bag was kept relatively soft, owing to the solicitude

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with which it was guarded ; the bags of down froze during the short operations necessary for getting into bed.

It was altogether unsatisfactory to lie down under frozen coverings and sleep in the wet ; it did not refresh the system at all after the fatigues of the day, and such repose was not very strengthening. Our teeth chattered while we thawed our clothes and the bag ; then gradually we found ourselves wrapped up, as it were, in a wet packing ; a drop of dew hung from every hair of the fur, and we had to wear woollen gloves while we slept, so as not to feel the unpleasant contact of water on our hands. The water saturated the bags of down, trickled into our clothes and on to our legs, which were the most drenched and the least covered parts, and penetrated to the skin. Of all the annoyances which troubled us, those connected with our sleep were the most unpleasant. How often did we not turn our thoughts and ardent longings to our modest little camp-bed at the hut !

When in the morning we slipped out of the bag, our outer garments froze on the surface, or else we put on the frozen clothes taken off the previous evening, and this outward skin of ice protected the deeper layers of clothing. This state of things lasted as long as the temperature did not rise above -30° .

In spite of all this we kept our health unchanged, and suffered neither from rheumatism nor any other ailment ; only on awakening we felt a numbness over all our persons ; the muscles seemed to be stiffened, and were slow and lazy in their movements. These were the effects of fatigue, cold, and of our hard, damp bed combined.

I have already mentioned the shape and the dimensions of the medicine-chest with which each detachment was provided. I shall now give a short description of its contents. The drugs were made up in doses, in the shape of compressed lozenges (tabloids

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and solids), enclosed in small phials, or glass tubes ; the dressings were in compressed packages.

DRUGS.—Laudanum, opium, tannin, salol, calomel, vegetable laxative, caffein, digitalis, strychnine granules, morphine, chloroform, ophthalmic discs, discs of corrosive sublimate.

FOR DRESSING.—Hydrophil cotton, gauze compresses, woollen bandages, starched bandages, Esmarck bandages, pieces of linen, two pairs of spectacles with smoked glass, trusses, sticking-plaster, a roll



OUR LAST GLIMPSE OF ALEXANDRA LAND

of diachylon plaster in strips, a square yard of waterproof cloth, a tube of boroglycerine, indiarubber cups, a wax taper and matches, soap, needles, safety-pins, a clinical spirit thermometer, a medicine-dropper, soft catheters of silk tissue, a pair of scissors, a bistoury, two Pean forceps, a probe with an eyelet, surgical needles, sterilised silk in little tubes, and a short guide to the use of drugs. In the medicine-chest of my department there was, in addition, a small case of surgical instruments, one of hypodermic instruments, and one for ophthalmic diseases.

This outfit was completed by two grooved and slightly curved

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aluminium splints for broken limbs, two inches wide and eighteen inches long.

My detachment, luckily, never required any help from the medicine-chest. We were very thin when we came back from the sledge expedition, but strong and in good health, hardened and inured to every sort of fatigue.

Physically, it was a complete and wholesome renovation of the system ; intellectually and morally, the continued struggle rendered us more energetic and self-reliant, more calm, tranquil, and steady in presence of danger, cool when judging a difficulty, and prudent, resolute, and firm in overcoming it. The mental strain had truly the effect of intellectual gymnastics, which rendered the perception, the analysis, and the synthesis of things and events more easy and rapid, and the decision more prompt and certain. Our personal temperaments came forth from it more gentle, less exacting, and more tolerant.

THE END

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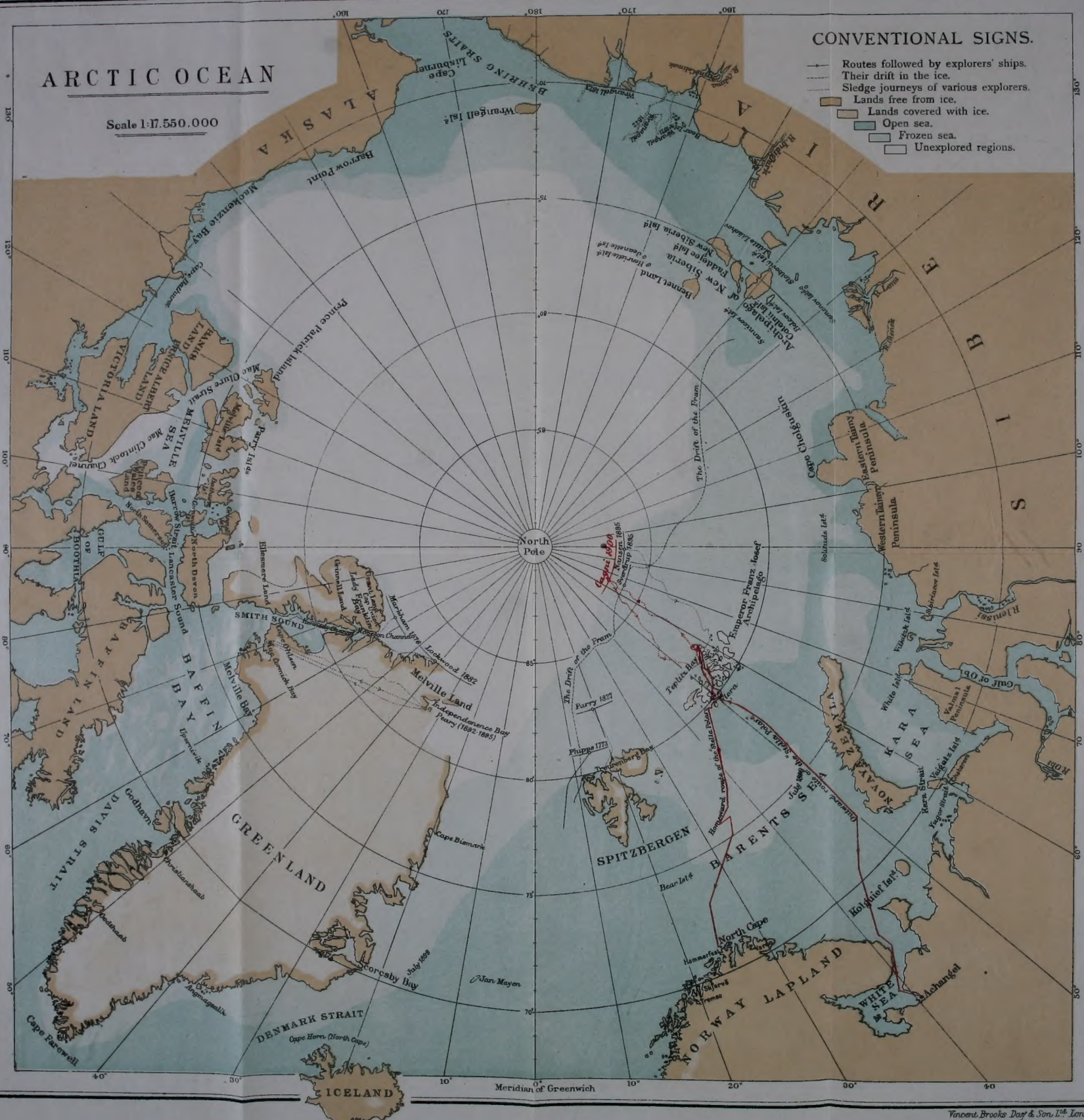
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ARCTIC OCEAN

Scale 1:17,550,000

CONVENTIONAL SIGNS.

- Routes followed by explorers' ships.
- Their drift in the ice.
- Sledge journeys of various explorers.
- Land free from ice.
- Land covered with ice.
- Open sea.
- Frozen sea.
- Unexplored regions.



THE EMPEROR FRANZ JOSEF ARCHIPELAGO.

According to the most recent explorations.

Payer (1872-74), Leigh Smith, (1880-81), Jackson (1893-97),

Nansen (1895-96), Wellman (1898-99).

H.R.H. Louis of Savoy (1899-1900).

GEOGRAPHICAL POSITIONS.

Name of the Place.	North Lat.	East Long.
Teplitz Bay (<i>The Large Hut</i>)	81 47 26	58 04 00
Cape Flora	79 56 47	50 09 30
Wilczek Isld. (<i>Extreme West</i>) (according to Payer)	79 55 57	58 07 48

Scale of 1 : 1,000,000

The heights are given in feet.

The state of the ice refers to the months of July and August, 1899.

Open sea.
Frozen sea.
Land covered with ice.
Land not covered with ice (the necessary data are wanting for the eastern part explored by Payer and Wellman).

QUEEN VICTORIA SEA



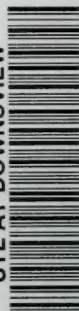
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